DOCUMENT RESUME

ED 138 770 CE 010 929

TITLE	Evasive and Emergency Curriculum for Driver Education.
INSTITUTION	Southern Illinois Univ., Carbondale. Safety Center.
SPONS AGENCY	Illinois State Office of Education, Springfield. Highway Safety Program.; National Highway Traffic Safety Administration (DOT), Washington, D. C.
BUREAU NO	06-05-02
PUB DATE	30 Jun 76
NOTE	212p.
EDRS PRICE	MF-$0.83 HC-$11.37 Plus Postage.
DESCRIPTORS	*Accident Prevention; *Driver Education; *High School Curriculum; *Learning Activities; Safety Education; Senior High Schools; *Skill Development; State Curriculum Guides; Traffic Safety; Training Objectives; Units of Study
IDENTIFIERS	Illinois

ABSTRACT

An advanced course to increase the student's driving ability and knowledge of the automobile is presented in this curriculum guide for use by high school driver education instructors. The course is designed for students who have been driving for 6 to 12 months or who have mastered basic driving skills. Focus is on advanced driving techniques, particularly those for handling emergencies. The guide includes introductory remarks to the instructor regarding program administration (e.g., insurance, cooperation with car dealers, and supervision of students). These are followed by a discussion of facilities, equipment, and vehicles necessary for the course and suggested daily and weekly checklists for driving instructors. The rest of the guide is divided into 12 units. Unit 1 is concerned with vehicle inspection, unit 2 covers predriving habits, the next eight units relate to various exercise maneuvers, unit 11 deals with emergencies due to equipment failure, and unit 12 presents tire information. Each unit contains the following parts: Required entry level, rationale, lesson objective, specific instructional objectives, learning activity, content, and evaluation. The recommended driving range layout for each of the exercises is included in each unit. A separate section at the end presents modifications to the exercise layouts for schools which do not have a large off-street driving range. Three appendixes contain recommended maximum and minimum distances for the maneuvers, suggestions for visual aids, a bibliography, and a media package with diagrams and graphics for use in the instructional units. A glossary of terms is also included. (LMS)

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ED138770

EVASIVE AND EMERGENCY CURRICULUM FOR DRIVER EDUCATION

Prepared Under Contract For
06-05-02
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Safety Education/Pupil Transportation Section
Springfield, Illinois

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June, 1976

CE 010 929

PREFACE

The development of safe driving habits among all American motorists is of principle concern to driver educators. The most effective means to this end is embodied in the expansion and improvement of programs in traffic safety education and training.

Driver education programs in the State of Illinois have long been concerned with this goal. However, a whole new dimension in instruction and training was made available to driver education with the passing of the Highway Safety Act of 1966.

The federal standard dealing with Driver Education, Highway Safety Program Standard 4, requires that the state provide a driver education program which provides experience in "basic and advanced driving techniques including techniques for handling emergencies." This worthwhile requirement is lacking in present driver education programs, with the major reason being lack of experience and confidence of driver education teachers to teach the skills. Further, appropriate materials are not available for such instruction and needed facilities are in general nonexistence.

Effective instruction in evasive/emergency driving must utilize conditions which closely resemble the conditions which will be experienced in the highway transportation system environment. The inclusion of evasive/emergency driving exercises,

on the streets and highways, in the basic driver education program is usually frowned upon.

From the above mentioned problem arises the need for education and training programs for teachers that include appropriate facilities and curriculum that will lead to the development of individual instructional skills.

The effectiveness of this training is largely dependent on a curriculum developed for the teaching of such skills. The intent of this publication is to provide high school driver education instructors with a curriculum guide which presents desirable instructional activities in a sequential order. The curriculum is designed so that a high school may adapt its program to meet all or specific aspects of the curriculum objectives. With appropriate adaptation this curriculum may be used by all driver educators in the schools of Illinois.

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TO THE INSTRUCTOR:
USE OF EVASIVE AND EMERGENCY DRIVING CURRICULUM

The overall goal of this curriculum is to increase the student's driving ability and knowledge of the automobile beyond what is usually contained in basic driver education instruction. This curriculum offers new opportunities and new challenges for both the instructor and the student. Thus, it is recommended that each teacher carefully review these introductory remarks and consider such as essential regarding the implementing of this program of instruction.

A review of accident causation research suggests that improper responses in emergency situations (e.g., braking, skid control, evasion, etc.) is a causal factor in a significant number of accidents. Therefore, if drivers could be taught to use proper car control procedures, it is logical to assume that there would be fewer accidents. The assumption that the reduction in crashes would take place is attributable to three changes which should occur as a result of the training:

1. The student would be better able to judge the capabilities and limitations of himself and his vehicle and thereby select an appropriate safety margin for hazardous situations.

2. The student would be less likely to panic in an emergency.

3. The student would be more likely to be able to execute a successful avoidance maneuver.

Although it is believed that there will be improvements in safety, careful consideration must be given to the placement of this material in a driver education program. The evasive and emergency maneuvers should not be taught to novice drivers. Six to twelve months of driving after licensing is recommended before exposure to this instruction. However, length of time is not as important as competency of basic driving skills. Students who have not mastered the basic driving skills should not receive this instruction. In addition to mastery of basic manipulative skills, students should have attained an acceptable level in the use of human functions of perception, judgment, and decision making before learning evasive/emergency driving techniques. Instructors must use their discretion in determining when students are ready for this material.

The above remarks are not meant to imply that it is impossible to include this instruction in a basic driver education course. However, it should be realized that its effectiveness will probably be reduced and it may produce a strain on available time and resources.

Administration of the Program

Implementing the Program

Teachers should receive approval from the school administration and/or school board before attempting to implement this curriculum. It is necessary that the school administration have a thorough understanding of the program the teacher wants to implement. This is essential to the success of the program. The parents of the students should also be advised regarding the nature and scope of the program. This should help to eliminate misunderstandings.

Insurance

The teacher should check to see that the cars are properly insured for use in this type of program. It is suggested that verification of coverage be in writing. For the teacher's own personal protection, the program should not be implemented unless the insurance provides the necessary coverages. This should be at least the same coverages as provided for the basic driver education program.

Importance of Proper Student Attitudes

Teachers should stress that the exercises contained in this curriculum should only be used in an emergency situation. Furthermore, teachers should stress that students who have the proper attitude and drive defensively seldom get into a situation

which requires evasive or emergency action. The purpose of this instruction is not to provide students with another means of taking more chances, but rather offer them one last chance to avoid an accident. Students who do not take this instruction seriously (e.g., showing off, driving recklessly through the exercises) should be dropped from the course. It should be remembered that improving driving skills, as important as it is, is no substitute for proper behavior on the part of the driver.

Teacher Competency

Under no circumstances should a teacher attempt to teach these exercises to students unless the teacher has been properly trained to conduct such a program. In addition, the teacher should be able to perform all the exercises with a high degree of proficiency. The teacher should also have a thorough understanding of the problem areas of each exercise. The teacher should possess the ability to explain to the student when an error has been made, what the error was, and how to correct the error.

As with any instructional program and possibly more so with this one, the teacher is the key factor in determining whether or not the program is a success.

Cooperation with the Car Dealers

Close cooperation between the car dealers loaning the

vehicles is essential. The dealer should be informed of the program and should also be advised that this type of instruction will not be abusive to the vehicle. The teacher should explain to the dealer that there will be possible wear and tear on the tires. It is recommended to demonstrate the course to the dealers at their convenience. This close cooperation between the instructor and the dealers will eliminate any misunderstandings.

In some areas, teachers have been able to secure tires free from a local tire dealer. This is a possibility which could be investigated by the teacher. Otherwise additional tires should be included in the driver education budget.

In any event, an understanding between the teacher and the dealer should be reached concerning the maintenance and repair of the cars to be used in this program.

Supervision of Students

Close supervision of students is a must. A teacher must maintain discipline while conducting this program. Inadequate supervision or lack of student control could result in an accident. Such an accident could result in unfavorable publicity for the school and could destroy the entire program for the school. Further it could result in a liability suit against the school and/or teacher. If the teacher(s) involved are competent and close supervision of the students is maintained,

there should be no major discipline problems.

A teacher should always be in the car while the student is performing an exercise. This is not the place for the paraprofessional.

Evaluation

It is important that some method be used to evaluate student performance. A sample evaluation form is provided for each of the exercises. This form is given only as a guide. Teachers may wish to develop their own form or instrument for evaluation purposes.

If the instructional units are taught in the sequence indicated, the teacher may wish to use the criteria for advancement which is given on each evaluation form. The student should not be allowed to advanced to the next exercise until the competency for advancement has been completed. If sufficient time and resources are available, the teacher may wish to use the criteria for mastery.

The teacher should note that the criteria for advancement and mastery for each exercise is based upon the highest recommended speed in each exercise. If space is limited and the dimensions of the exercises are reduced, the speeds must also be reduced, and thus the criteria for advancement/mastery will need to be changed. Note: Changes and adaptation of the speeds and exercise layouts for smaller facilities are presented in a

later discussion. The instructor must use his discretion in determining the criteria for advancement based upon the facilities and the capabilities of the vehicles being used in the program.

The teacher should become thoroughly familiar with the evaluative instrument to be used. Otherwise, the evaluative process may become quite time-consuming and the amount of time available for training may be affected.

FACILITIES, EQUIPMENT, AND VEHICLES

Course Layout

Each school may wish to develop and build a facility to suit its own needs and within available funds. The development of an exercise area will entail three major expenditures: land acquisition, construction, and operating cost. Some schools have discovered that an existing paved area of sufficient size can be readily adopted for use as a training area for evasive/emergency driving techniques. This may be a multiple-car driving range or a large parking lot.

The ideal situation would be to have a large paved facility 600 feet by 600 feet. However, it is realized that the average driving range is approximately 400 feet by 200 feet. With this in mind, the exercises have been designed accordingly.

Safety Aspects

When selecting an area, certain safety precautions must be observed:

1. The area must be flat, free of dips or bumps, and have sufficient grade to allow water to run off the surface. A 1% grade is recommended. Center drains should not be used on the surface.

2. The driving and surrounding areas must be free of curbing and obstacles.

3. The driving area should be paved with concrete or asphalt.

4. A minimum of 50 feet between exercises should be maintained if more than one vehicle is operating in the area.

5. Speeds must be adjusted to fit the size of the driving area and the number of vehicles accommodated. The smaller the facility, the lower the speeds at which the exercises can be run.

Course Setup

It is recommended that a scale drawing be made of the driving area and available for instructional purposes. The instructor can then discuss and locate each exercise before starting the practice runs. The exercises can be laid out with paint and traffic cones. The following minimum amount of equipment is recommended:

1. 50 to 111 12-inch traffic cones
2. 100-ft. tape or measuring wheel
3. Spray paint in various colors to code exercises
4. Numbers inside and outside the vehicle for identification by the student and instructor
5. Communication systems within each vehicle (must be adequately secured)
6. One set of tires for exclusive use for evasive/emergency program.

Type of Vehicle and Preparation

A standard four-door sedan is recommended for the use in this program. The availability of vehicles from the local dealers may cause a problem and therefore you may not be able to receive the type of vehicle you had desired.

The vehicles must be in good condition and should be inspected both daily and weekly. It is recommended that the

instructor use a daily checklist during the inspection to make certain that nothing is omitted. A copy of a suggested checklist is given on page 12.

Weekly inspection and maintenance should be done by the dealer providing the vehicles or by a qualified mechanic and should include those items listed on the Weekly Inspection and Maintenance Checklist. A copy of a suggested checklist is given on page 14.

This would be in addition to the service schedule prescribed in the owners manual. Inspection and maintenance is an absolute must in all driving programs. Any time the automobile does not handle or respond properly, it should be checked by a qualified mechanic.

Vehicle Recommendations

It is advisable to take advantage of all manufacturer options which provide for increased capacity and performance. Other features which help to create an environment that are more conducive to the teaching/learning situation are desirable.

Heavy duty suspensions, disc brakes and wheels will provide added durability for this type of usage and will provide vehicles similar to those purchased for today's driving.

A high performance power train will make it possible to

obtain speeds in short distances, which contairs a high displacement engine, a three speed automatic transmission, and an axle ratio in the range of 3.42 to 1.

Air conditioning provides a better teaching/learning environment during hot weather. Also cars so equipped come with additional power output.

Power seats and tilt steering wheel give greater control in conforming to people of various sizes and shapes, and power steering reduces fatigue.

Radial tires are recommended for use in these emergency/evasive exercises. Presently radial tires are standard equipment for most new automobiles.

It should be pointed out that the above are ideal recommendations. In most cases, driver education teachers will have to accept the cars that the dealers offer them.

EVASIVE - EMERGENCY DRIVING PROGRAM

SUGGESTED DAILY INSPECTION CHECKLIST FOR DRIVING INSTRUCTORS

Date_____

Tires

Tread Depth_____

Inflation Pressure_____

Check Cracks, Cuts_____

Wheels

Rim Damage_____

Lug Nuts_____

Engine Compartment

Oil Level_____

Transmission Fluids Level_____

Coolant Level_____

Brake Fluid Level_____

Battery Fluid Level_____

Accessory Belts_____

Power Steering Fluid Level_____

Driver and Passenger Compartment

Brake Operation_____

Steering System_____

Restraint System_____

Looses Objects Secured_____

Trunk Compartment

Spare Tire and Jack Secured_____

Special Equipment on Blowout and Skid Car Secured_____

Air Tanks Filled_____

Check Fuel Level_____

Other_____

EVASIVE - EMERGENCY DRIVING PROGRAM

SUGGESTED WEEKLY INSPECTION AND MAINTENANCE CHECKLIST

Date_____

Engine Tuneups_____

Oil Change_____

Points and Plugs_____

Transmission Fluid Level_____

Coolant Level_____

Brake Fluid Level_____

Battery Fluid Level_____

Accessory Belts_____

Power Steering Fluid Level_____

Engine Mounts_____

Wheel Bearings_____

Seals_____

Drivetrain_____

Exhaust System_____

Wheel Alignment_____

Suspension System_____

Hood Latch_____

Door Locks_____

Mirrors_____

Seat Belts--webbing, mounts, latches, retractors_____

Windshield Wiper and Washers_____

Lighting System_____

Other_____

INTRODUCTION

EVASIVE/EMERGENCY DRIVING COURSE OF INSTRUCTION

The following course of instruction is divided into thirteen (13) instructional units. Unit 1 is concerned with Vehicle Inspection, while Unit 2 covers Pre-driving Habits. The next eight units relate to various exercise maneuvers. Unit 11 will deal with emergencies involving failure of the vehicle's equipment. Unit 12 deals with tire information. The remaining unit (no. 13) is concerned with range modifications.

If only one exercise is to be taught at a time, then it is recommended that the units be taught in the sequence listed. However, if there are a large number of students to be accommodated, it may be necessary to run two or three of the exercises concurrently. Of course, this is assuming that the school has adequate space and sufficient instructors.

If two or more exercises are to be taught at the same time, the following is suggested. The Serpentine (Unit 3), Off-Set(Unit 4), and Off-Road (Unit 5) should be the first exercises taught. Controlled Braking (Unit 6) and Evasive Maneuvers (Unit 7) may be taught interchangeably. Likewise, Skid Control (Unit 8), Blowout Recovery (Unit 9, and the Evasive Maneuvers on a Wet Surface (Unit 10) should be taught together.

In order to take advantage of all available instructional time, the teacher should have each lesson planned in advance. The instructional area should be laid out with all cones, equipment, and other necessary items in place. The teacher should demonstrate each exercise before allowing the student to begin. The student should begin each exercise at the lowest recommended speed. The teacher should not allow the student to advance to a higher speed until the exercise is performed satisfactorily at the lower speed.

UNIT 1

VEHICLE INSPECTION

Required Entry Level

The student will possess a valid driver's license and will have successfully achieved a mastery of the basic car control skills of starting, stopping, and steering.

Rationale

Research indicates that approximately 5 percent of all accidents occur because of vehicle malfunction. The student needs to realize the importance of inspection and maintenance as they affect the safe and efficient operation of the vehicle. This unit is designed to provide students with the knowledge necessary to conduct routine inspections of the vehicle.

Lesson Objective

The student shall identify the daily and the weekly inspections and maintenance to be performed on the vehicles.

Specific Instructional Objective	Learning Activity
1. The student will perform the pre-driving daily inspections on each vehicle to be used.	1. The instructor will discuss and describe the daily inspections which are to be performed on the vehicles. 2. The instructor will give each student a copy of a daily inspection checklist. This should be used to be sure all items are covered.

Content

Tires
- tread depth
- inflation pressure (32 psi)
- checks cracks and cuts
- rim damage

Wheel Lug Nuts
- proper torque (60-80 Ft. Lbs.)

Engine Compartment
- oil level
- coolant level
- brake fluid level
- battery water level
- accessory belts
- power steering fluid level
- transmission fluid level

Driver and Passenger Compartment
- brake operation
- steering system
- restraint system
- radio system
- secure all loose objects

Trunk Compartment
- spare tire and jack secured
- all special equipment secured

Evaluation

The student will identify by name, state the location of, and discuss the function of all controls and assemblies identified. This should be done through the use of a teacher led discussion using an actual vehicle as a model.

Specific Instructional Objective	Learning Activity
2. The student will identify proper weekly inspection and maintenance to be done by the dealer who is providing the vehicle, or by a qualified mechanic.	1. The instructor will give each student a copy of a weekly inspection and maintenance schedule to be followed.

Content

Engine Tuneup
Engine Mounts
Wheel Bearings
Seals
Drivetrain
Exhaust System
Suspension System
Wheel Alignment
Hood Latch
Door Locks
Mirrors
Seat Belts--webbing, mounts, latches, retractors
Windshield Wipers and Washers
Lighting System

This would be in addition to the service schedule prescribed in the owners manual. Inspection and maintenance is an absolute necessity in all driving programs. Any time the automobile does not handle or respond properly, it should be checked by a qualified mechanic.

Evaluation

The student will name the items that should be included in the weekly inspection and maintenance program.

UNIT 2

PRE-DRIVING HABITS

Required Entry Level

The student is able to identify all items and systems on the daily and weekly inspection checklists.

Rationale

The techniques described in the following units are different than those used in normal driving situations. This unit is intended to serve as a review for SIPDE and the basic pre-driving habits. In addition, the students will be introduced to a different hand position on the steering wheel which is necessary in performing the evasive and emergency maneuvers.

Lesson Objective

The student will discuss the importance of SIPDE, seat adjustment, use of the mirrors, seatbelts, and hand position.

Specific Instructional Objective	Learning Activity
1. The student will define and relate the SIPDE concepts to the driving environment.	1. The teacher will discuss handouts which gives definition of SIPDE concept. 2. The instructor will use slides, flip charts, or films of different driving environments. Situations pointing out SIPDE concepts.

Content

1. Search: To scan the driving environment for possible hazards.
2. Identify: Through the use of visual clues in the prime search area, one must recognize the potential hazards.
3. Predict: In the prime search area, one predicts what the potential hazards might do or where it will come from.
4. Decide: What you, as a driver, are going to do to avoid the potential or actual hazards.
5. Execute: The process of carrying out the best decision in avoiding those hazards.

Evaluation

The student will understand SIPDE and explain its importance to the driving task.

Specific Instructional Objective	Learning Activity
2. The student will demonstrate the proper seat adjustment to allow maximum freedom to maneuver the vehicle with ease.	1. The instructor will use one of the vehicles in the program as a model to explain proper seat adjustment.

Content:

The seat should be positioned as far back as your leg length will allow and still be able to operate the foot controls. In this position, the thighs should be resting on the seat and the knees should be slightly flexed. After the

proper seat position is achieved, make sure the seat is locked. The seat position can be checked by placing the hands at 9 and 3 o'clock on the steering wheel. This position should not feel cramped. It is important for being able to steer quickly that arms are extended, moving the elbows away from the body. The student should also be able to see over the steering wheel.

Evaluation

The student will demonstrate the proper seat adjustment by adjusting the seat of one of the vehicles to his own physical dimensions.

Specific Instructional Objective	Learning Activity
3. The student will demonstrate the proper adjustment of the inside mirrior and the outside mirror.	1. The instructor will use one of the vehicles in the program to explain and demonstrate the proper adjustment of the mirrors.

Content

The proper adjustment of mirrors is an important aspect of the pre-driving habits. After the seat has been adjusted, sit back in the seat and adjust the inside mirror so it highlights the right rear of the vehicle and you can see several hundred feet behind it. The outside mirror should be adjusted from the same sitting position so you can see several hundred feet to the rear using the rear fender edge as a

reference point. The proper adjustment of the mirrors will allow you to see traffic conditions behind you at a glance.

Evaluation

The student will demonstrate the proper mirror adjustment by adjusting the inside mirror and the outside mirror on one of the vehicles used in the program.

Specific Instructional Objective	Learning Activity
4. The student will demonstrate the correct method for properly adjusting the safety belt.	1. The instructor will use one of the vehicles in the program as a model to explain the correct method for adjusting the safety belt.

Content

The use of safety belts will reduce the possibility of being thrown into the dashboard or windshield. In emergency situations, safety belts will also help you to maintain control by keeping you behind the wheel. In cars manufactured before 1974, it is usually necessary to manually adjust both the lap and shoulder belts for proper fit. The lap belt should fit snugly across the hips. In adjusting the shoulder belt, there should be just enough slack to allow you to place your fist between the belt and the center of your chest.

Evaluation

The student will demonstrate the correct method for properly

adjusting the safety belt by adjusting the safety belt in one of the vehicles to his own physical dimensions.

Specific Instructional Objective	Learning Activity
5. The student will demonstrate the "9 and 3" hand position on the steering wheel and explain the effectiveness of this position.	1. The instructor will use one of the vehicles as a model to explain and demonstrate the proper use of the "9 and 3" hand position.

Content

Place hands as near to the 9 and 3 o'clock on the steering wheel as possible. This balanced hand position will enable one to make a 180° turn of the steering wheel in the shortest possible time. The balanced hand position also prevents unwanted steering to be put into the vehicle caused by body motion. If it becomes necessary to turn more, the hand-over-hand method of steering will be used.

Evaluation

The student will demonstrate the 9 and 3 position using one of the vehicles in the program. The student will discuss the reasons for using this hand position.

UNIT 3

SERPENTINE

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits necessary to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

Many drivers, through their own faults, or due to the actions of others, often find themselves in a situation where evasive and emergency action is necessary to avoid an accident or at least reduce the severity of an impending crash. The serpentine is an exercise which gives the student the opportunity to develop a sense of control of the vehicle and improve perceptual skills. The student practices the skills of throttle control, timing, rhythm, and steering imputs. This knowledge and skill serves as a foundation for future evasive and emergency maneuvers.

Lesson Objective

The student will develop a sense of control of the vehicle by learning proper timing of steering inputs and judging the relationship of fixed objects with respect to the vehicle.

Specific Instructional Objective	Learning Activity
1. Given a straight line of traffic cones which are placed fifty feet apart, the student will weave in and out of the line of cones at a constant speed without diverging from the designated path and without hitting or knocking over any cones.	1. The instructor will make sure the student completely understands the procedure. 2. The instructor will demonstrate the maneuver while emphasizing proper hand position, throttle control, timing and rhythm.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. Enter the course at a speed selected by the instructor, usually 15 mph to start.
4. Try to develop a rhythm for the steering motion to accomplish smooth maneuvers and control of the vehicle.

This course should be repeated at increasing speeds until the student can no longer drive the vehicle through the course successfully. Speeds at which the exercise should be accomplished (higher speeds are not recommended for high school students):

1. 15 mph
2. 20 mph

Variation to Exercise

Student proceeds forward through the exercise, then backs up through the course to the starting position (emphasis on precision and safety, not on speed).

Exercise Layout

An approach lane 75 feet long leading to a straight line of cones set 50 feet apart for a length of 250 feet. A full lane of 12 feet should be available on either side of the serpentine course. An outrun area of 75 feet is desirable.

Evaluation

Instructor opinion; the student shall weave through the cones at a constant speed without diverging from the designated path and without hitting any of the cones. At least two error-free runs at 20 mph should be completed.

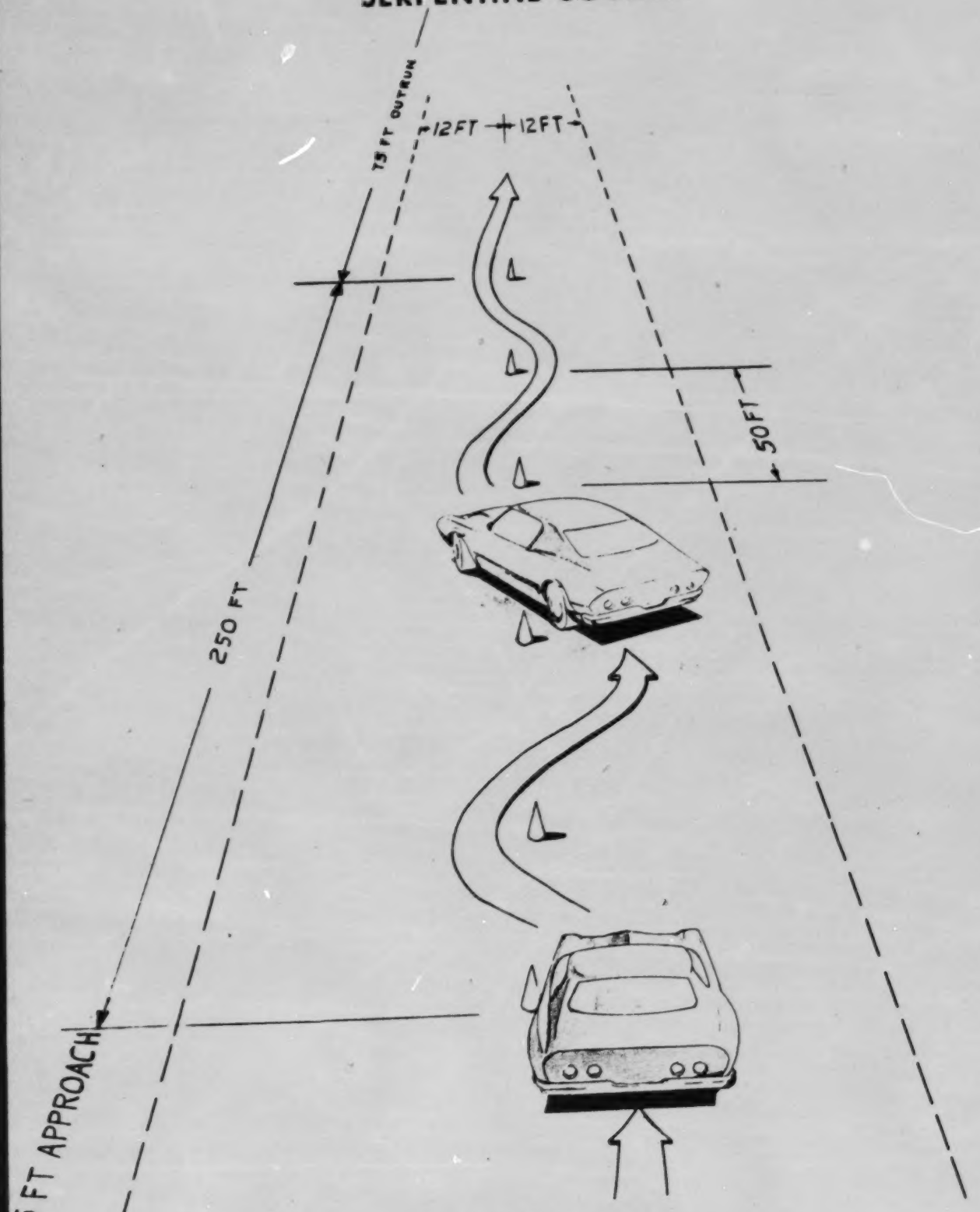
Problem Areas

1. Steers too little and hits the cones with the front wheel.
2. Steers too much so that the vehicle keeps swinging farther and farther out and can't negotiate the last few cones.
3. Fails to maintain constant speed.
4. Moves hands on steering wheel and loses his reference point.
5. Comes in at too wide an angle on the first cone, which means the car is in a poor position to complete the exercise properly.

6. Is late or early with his steering inputs.

7. The vision of the driver is aimed too low.

SERPENTINE COURSE



STUDENT EVALUATION

Unit 3
Serpentine

Name_____
Date_____
Evaluator_____

---

1. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

2. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

3. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

4. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

Criteria for Advancement/Mastery

Advancement: Instructor opinion; completion of at least two error-free runs at 25 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 25 mph.

UNIT 4

OFF-SET

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

The off-set is an exercise designed to teach advanced precision vehicle handling skills on a forward and backward path. This exercise and serpentine serves as a foundation for the emergency and evasive maneuver.

Lesson Objective

The student will develop precise handling skills of the vehicle while driving the car forward and backward through the off-set lane.

Specific Instructional Objective	Learning Activity
1. Given the off-set lane, the student will drive forward through the maneuver without displacing any cones.	1. The instructor will explain to the student the objective of the exercise and review the proper procedure for running the exercise. 2. The instructor will demonstrate the maneuver so the student can get an idea of the type of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. The driver will negotiate the maneuver going forward at various speeds.

Evaluation

Instructor opinion; the student will drive successfully forward through the maneuver several times without hitting any cones.

Specific Instructional Objective	Learning Activity
2. Given the off-set lane, the student will drive backward through the maneuver without displacing any cones.	1. The instructor will explain to the student the objective of the exercise and review proper procedures for running the exercise. 2. The instructor will demonstrate the maneuver so the student can get an idea of the type of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed proper driving position; able to get a big picture looking through the rear window.
3. The driver will negotiate the maneuver going backward at various slow speeds.

Evaluation

Instructors opinion; the student will drive successfully backward through the maneuver several times without hitting any cones.

This course should be repeated until the student has developed good precision and rhythm in steering. Speed is not as important as learning the handling of a vehicle.

Variation to the Exercise

Difficulty of the exercise may be varied by reducing the lane width from 12 to 10 feet.

Exercise Layout

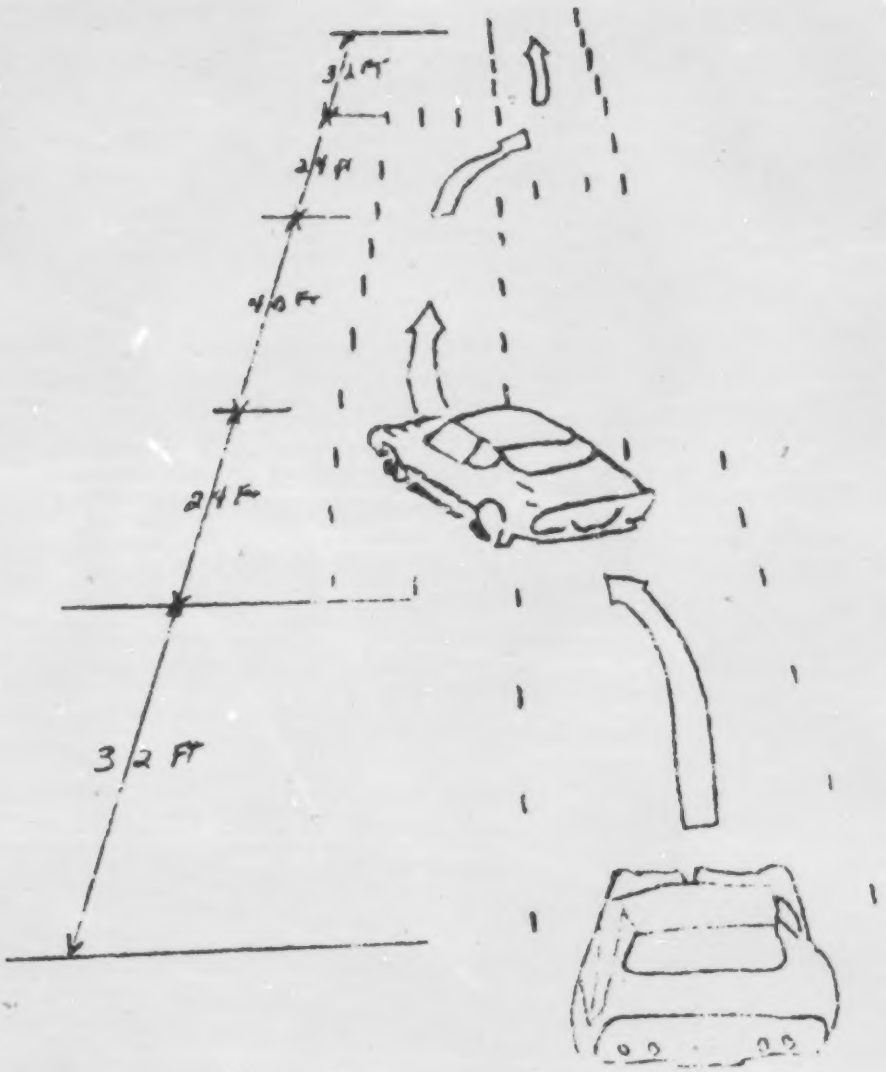
The approach lane is 32 feet long and 12 feet wide with a left lane change area 24 feet long and 24 feet wide. The left lane is 40 feet long and 12 feet wide with a right lane change area 24 feet by 24 feet. The outrun area is 32 feet long and 12 feet wide.

Problem Areas

1. The student will be aiming (looking at cones directly in front of car) too low through the maneuver.
2. The student's speed will be too fast for the maneuver.
3. The student's steering input will be too soon and/or too late.
4. The student's steering recovery will be too soon and/or too late.

5. The students will turn the vehicle in wrong direction while backing.

OFF-SET LANE



43 APPROACH

STUDENT EVALUATION

Unit 4
Off Set

Name_____
Date_____
Evaluator_____

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1. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

2. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

3. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

4. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Late____
   Throttle Control: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

Criteria for Advancement/Mastery

Advancement: Instructor opinion; completion of at least two error-free runs at 25 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 25 mph.

UNIT 5

OFF-ROAD RECOVERY

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits necessary to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

When a car wheel drops off the edge of the road, it is best to slow down or stop and check traffic before pulling back onto the roadway. However, occasionally, traffic and/or road conditions may force the driver to return to the roadway immediately. Accident records have indicated that a significant number of highway accidents are due to the failure of the driver to control the car properly when attempting to return to the roadway at highway speeds. Thus it seems appropriate to include instruction that will provide the student with the knowledge and skills necessary to safely return to the roadway.

Lesson Objective

The student will develop the skill of properly returning to the road surface after driving off the road at a designated speed.

Specific Instructional Objective	Learning Activity
1. Given a lane of traffic cones ten feet in width and an area adjacent to the lane which is 4 inches below the level of the designated lane of travel, the student will, at a point designated by the instructor, take the vehicle halfway off the roadway (leaving left wheels on the pavement), and return the vehicle to the roadway without hitting any cones. This exercise can also be done in the opposite direction.	1. The instructor will explain to the student the objective of the exercise and review the proper procedure for running the exercise. 2. The instructor will demonstrate the maneuver so the student can get an idea of the type of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. Accelerate down the cone-marked lane at a speed determined by the instructor.
4. At the beginning of the curb, the student will drop the right wheels off the edge of the road, while maintaining speed, or straddle the curb as he approaches.
5. Center the vehicle over the curb so the wheel has room to turn.
6. Halfway down the curb or at the instructor's command, the student will turn the steering wheel approximately 90° to the left to return back in the proper lane.
7. As soon as the student feels or hears the right front

wheel hit the curb, he must immediately steer approximately 180° to the right to maintain lane position and then back 90° for center steer.

8. The student should slow down and brake to a stop.
9. Have the student turn the vehicle around and run the exercise the other way, dropping the left wheels off the edge. The procedure is the same except the steering directions are reversed.

Evaluation

Instructor opinion; the student should repeat the exercise until his performance is satisfactory. At least two error-free runs at 30 mph should be completed.

Specific Instructional Objective	Learning Activity
2. Given a lane of traffic cones ten feet in width and an area adjacent to the lane which is 4 inches below the level of the designated lane of travel, the student will be able to, at a point designated by the instructor, take the vehicle completely off the roadway (four wheel drop-off), and return the vehicle to the roadway without hitting any cones. This exercise can be run in both directions.	1. The instructor will explain to the student the difference between the two-wheel drop-off and the four-wheel drop-off. 2. The instructor will demonstrate the maneuver so the student can get an idea of the type of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.

2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. Accelerate down the cone-marked lane at a speed determined by the instructor.
4. At the beginning of the curb, the student will drop all four wheels off the edge of the road, while maintaining speed.
5. Halfway down the curb or at the instructor's command, the student will turn the steering wheel approximately 90° left, depending on the vehicle and speed.
6. As soon as the student feels or hears the right front tire hit the curb, he must steer approximately 180° to the right to maintain lane position and then back 90° for center steer.
7. The student should slow down and brake to a stop.
8. Have the student turn the vehicle around and run the exercise the other way. The procedure is the same except the steering directions are reversed.

For high school students the exercise should be accomplished at the following speeds:

1. 20 mph
2. 25 mph
3. 30 mph
4. 35 mph (for advanced students and if time and space permits)

Exercise Layout

The course should consist of an approach lane 100 feet long,

200 feet of 4-inch curbing, and a 100 foot runout lane. A full ten foot lane is required adjacent to the curbing between the curb and the edge of the paved area. The ten foot lane adjacent to the curbing should be marked by cones 6 feet apart. If the exercise is run at 35 mph, the approach lane and outrun lane should be substantially longer.

Evaluation

Instructor opinion; the student should repeat the exercise until his performance is satisfactory. At least two error-free runs at 30 mph should be completed.

Problem Areas

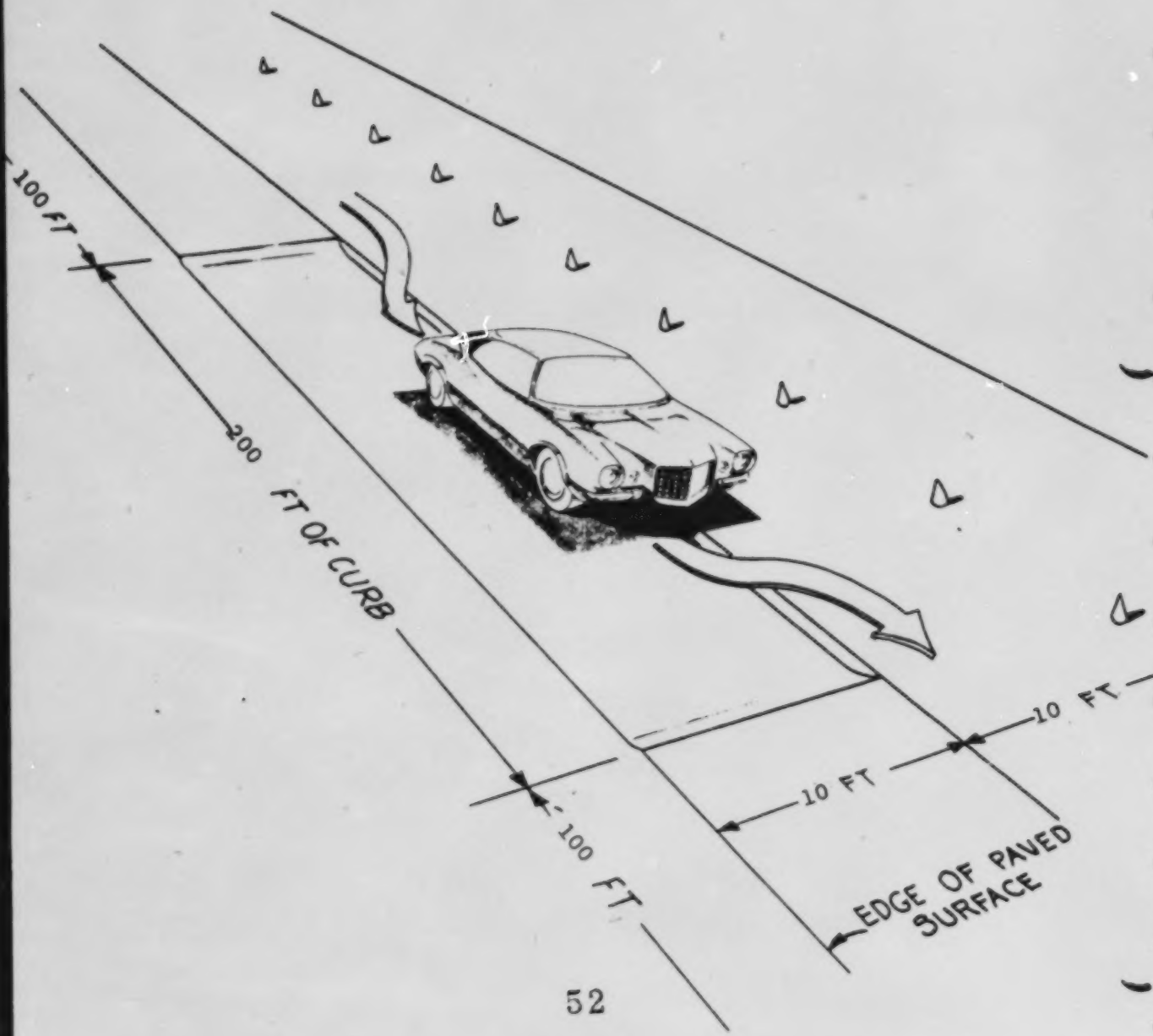
1. The student does not center the vehicle on curbing, thereby not giving the wheels room to assume the proper angle to come up over the curb. Tires will scrub or hook curb.
2. The student does not have the vehicle far enough from the edge of the curb, thereby not giving the wheels room to assume the proper angle to come up over the curb. Tires will scrub or hook curb. (Applies only to the four-wheel drop-off).
3. Steering is too slow, thus causing the tires to scrub, which will then require more steering to get the tire to climb the curb. When the tires do hop up on the curb, the student will steer so far left that he cannot steer

right quickly enough and will run out of the lane.

4. Steers too slow right causing the vehicle to leave the lane.
5. Steers right more than necessary, causing the vehicle to drop back off the road.
6. The student does not have a firm grip of the steering causing loss of control of the vehicle.
7. The student panics and uses the brakes or accelerator possibly causing the vehicle to skid.

Instructor Note: With only 100 feet for the approach, it may be difficult to run the exercise with four wheels off. Unless additional space is available, it may be desirable to only run the two wheel drop-off.

OFF-ROAD RECOVERY



STUDENT EVALUATION

Unit 5
Off-Road Recovery

Name_____
Date_____
Evaluator_____

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1. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Brake: Yes____ No____
   Car position after wheel drop off: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

2. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Brake: Yes____ No____
   Car position after wheel drop-off: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

3. Speed:____
   Hand Position: OK____ Needs Improvement____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Brake: Yes____ No____
   Car position after wheel drop-off: OK____ Needs Improvement____
   Number of cones hit:____
   Overall Performance: Good____ Average____ Poor____
   Comments:

Criteria for Advancement/Mastery

Advancement: Instructor opinion; completion of at least two error free runs at 30 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 30 mph.

UNIT 6

LEFT-RIGHT EVASIVE MANEUVER

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits necessary to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

Beginning drivers, as well as some experienced drivers, are likely to over brake when encountering pedestrians, animals, or cyclists in the car's path. However, this may not always be the quickest or best way to avoid an accident. In many situations, the best way to avoid an accident is to evade the obstacle in your path. It is important for the student to be aware of the capabilities and limitations of the vehicle so that he will be in a better position to adequately respond to emergency situations. The student also needs to develop confidence in his ability to perform this maneuver. This exercise gives the student an opportunity to practice the techniques necessary for handling the unusual situation.

Lesson Objective

The student will demonstrate that the vehicle, when properly driven, has the capability to avoid an obstacle in a shorter distance by just steering (cornering), than can be done by panic breaking at various speeds.

Specific Instructional Objective	Learning Activity
1. Given a 12 foot lane of traffic cones and a barricade placed fifty feet from a double cue cone, the student will evade the barricade either to the left or right, depending upon the command of the instructor. The student must not hit any cones and maintain lane position after evading the barricade.	1. The instructor will explain to the student the objective of the exercise and review the proper procedure for running the exercise. 2. The instructor will demonstrate the maneuver so the student can get some idea of the type of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. The student should accelerate down the approach lane at a speed determined by the instructor.
4. At the double cue cone, the student will attempt to evade the barricade without braking. The direction and initiation of the maneuver will be determined by the instructor, using a verbal command of right or left.
5. After the student has evaded the obstacle, he must turn the steering wheel the exact same amount in the opposite direction to stay in the proper lane.
6. The student should brake to a stop and repeat the exercise until the instructor is satisfied with his performance.

For high school students the exercise should be accomplished at the following speeds:

1. 20 mph
2. 25 mph
3. 30 mph
4. 35 mph (for advanced students and if time and space permits)

Exercise Layout

The course should consist of an approach lane 12 feet wide and at least 200 feet long leading toward a cone barrier. It should include a 12 foot leadout lane on either side of the barrier and extend for 50 feet. A double cue cone serves as a cue point. Spacing between cones on the approach lane is 50 feet and spacing between cones on the leadout lane is 6 feet. There should be an outrun area about 150 feet long.

Evaluation

The student should repeat the exercise with the instructor giving the direction cue at random until he is satisfied that the student has acquired the skill to perform an effective evasive maneuver. At least two error-free runs at 30 mph should be completed.

Problem Areas

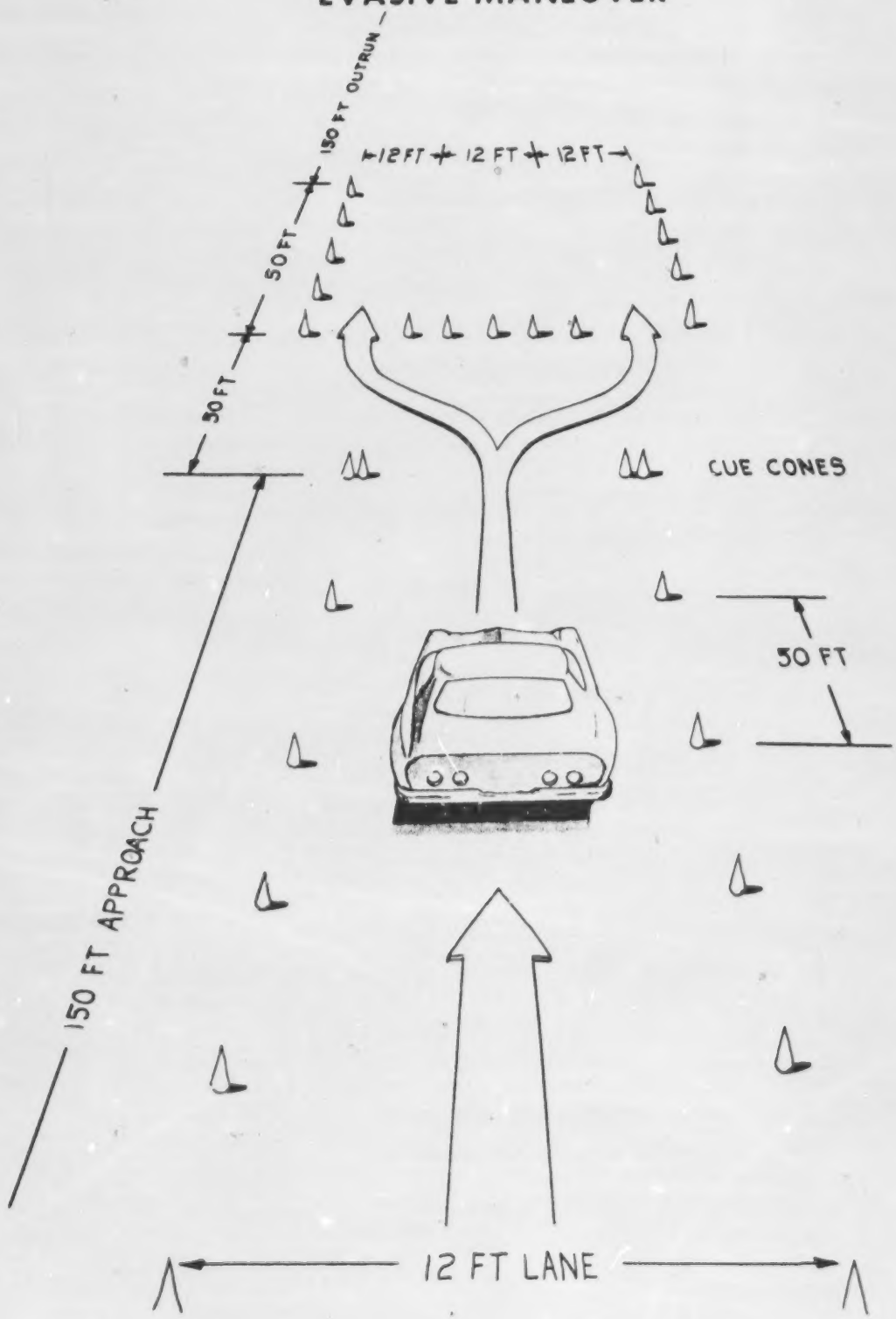
1. Turns wrong way each time--usually caused by anticipating the direction.
2. Steers and countersteers late--wipes out the course.
3. Overapplies throttle.
4. Poor hand position--fights the steering wheel.
5. Panic brakes and slides through the barrier.
6. Oversteers, causing the vehicle to hit both sides of the cone lane.

7. Attempts to go in wrong direction and then tries to recover. Once the student has committed the vehicle in one direction he should continue in that direction. He cannot recover in time to make any corrections.

8. The vision of the driver is aimed too low.

LEFT-RIGHT

EVASIVE MANEUVER



STUDENT EVALUATION

Unit 6
Left-Right Evasive

Name_____
Date_____
Evaluator_____

---

1. Speed:____
   Reaction time: Quick____ Average____ Slow____
   Hand Position: OK____ Needs Improvement____
   Brake: Yes____ No____
   Throttle: Yes____ No____
   Anticipates direction of command: Yes____ No____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Lane position maintained: Yes____ No____
   Hits barrier cone(s): Yes____ No____
   Overall Performance: Good____ Average____ Poor____
   Comments:

---

2. Speed:____
   Reaction time: Quick____ Average____ Slow____
   Hand Position: OK____ Needs Improvement____
   Brake: Yes____ No____
   Throttle: Yes____ No____
   Anticipates direction of command: Yes____ No____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Lane position maintained: Yes____ No____
   Hits barrier cone(s): Yes____ No____
   Overall Performance: Good____ Average____ Poor____
   Comments:

<u>Criteria for Advancement/Mastery</u>

Advancement: Instructor opinion; completion of at least two error-free runs at 30 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 30 mph.

UNIT 7

CONTROLLED BRAKING

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

In many cases, the first reaction of drivers in an emergency situation is to apply the brakes. The problem which occurs many times is that drivers apply the brakes too hard causing wheel lockup and sliding. If this occurs the vehicle cannot be steered. The student must develop the ability to sense wheel lockup so he can get maximum braking without lockup while retaining steering control. The controlled braking exercise is intended to provide the student with this experience.

Lesson Objective

The student will perform maximum controlled braking to stop the vehicle while still retaining steering control.

Specific Instructional Objective	Learning Activity
1. Given a twelve foot wide lane the student will approach the barricade at a speed selected by the instructor. At the instructor's command, the student brings the vehicle to a stop in the shortest distance while steering around the barricade and back into his own lane.	1. The instructor will explain the controlled braking exercise to the student, making sure he understands that the brakes are to be used to the point just before lockup. 2. The instructor will demonstrate the controlled braking maneuver.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. The student will proceed down the approach lane at a speed selected by the instructor.
4. At the double cue cone, the instructor will give a verbal command to initiate braking and evade the barrier.
5. At the command, the student will steer the vehicle to evade the barrier and simultaneously brake.
6. As soon as the first barrier is cleared, steer back to the right-hand lane to evade the second barrier, and come to a stop in the shortest possible distance.
7. A steady squeezing force on the brake pedal is usually the best method of applying the brakes. If the brakes lock, ease up on the brakes and then resume braking.

For high school students the exercise should be accomplished at the following speeds:

1. 25 mph
2. 30 mph
3. 35 mph

Exercise Layout

An approach lane at least 200 feet and preferably 250 feet long and 12 feet wide leading to a cone barrier. A double cue cone is placed on the approach lane fifty feet from the barrier. From the first barrier it is 60 feet to the second barrier. A left lane adjacent to the approach lane, starting 50 feet from the barrier and extending 60 feet beyond the barrier with the ends closed. There should be a 100 foot out-run area.

Evaluation

The student shall perform the controlled braking exercise without locking the brakes or displacing any of the traffic cones. At least two error-free runs at 35 mph should be completed.

Problem Areas

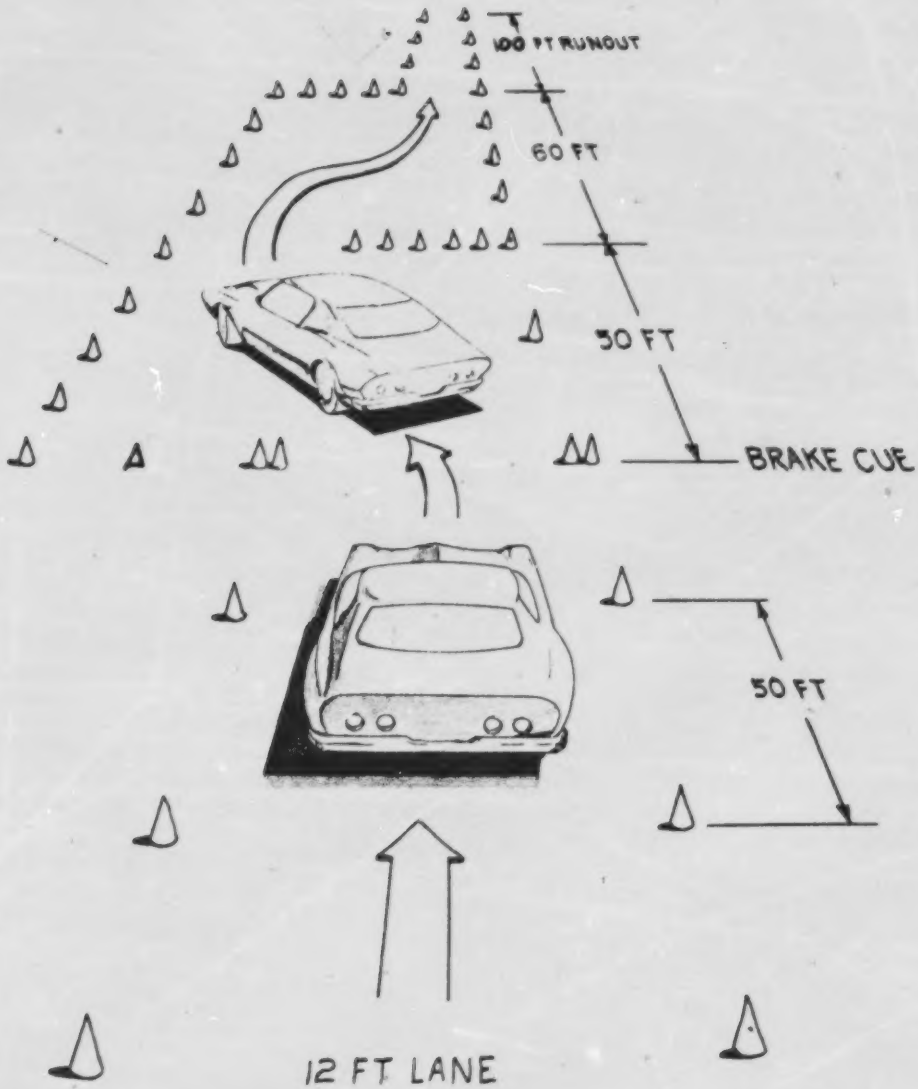
1. Locks brakes and thereby loses steering control.
2. Steers too much and cannot make it back to the right in time to miss the second barrier.
3. Does not steer enough and hits the first barrier.
4. Anticipates the cue and brakes too soon.
5. Does not come to a complete stop at the end of the course.

6. Fails to return to the right hand lane.

7. Vision of driver is aimed too low to see the intended path of travel.

Instructor Note: The verbal command to initiate braking is left up to discretion of the instructor. The instructor may wish to use the word "now" or "brake" or some other similar command.

CONTROLLED BRAKING



STUDENT EVALUATION

Unit 7
Controlled Braking

Name _____
Date _____
Evaluator _____

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1. Speed: _____
   Reaction Time: Quick _____ Average _____ Slow _____
   Hand Position: OK ___ Needs Improvement ___
   Released Throttle: Yes ___ No ___
   Steering Input: OK ___ Too Much ___ Too Little ___
   Locked brakes and lost steering control: Yes ___ No ___
   Hit cones: Yes ___ No ___
   Overall Performance: Good ____ Average ____ Poor ____
   Comments:

---

2. Speed: _____
   Reaction Time: Quick ____ Average ____ Slow ____
   Hand Position: OK ___ Needs Improvement ___
   Released Throttle: Yes ___ No ___
   Steering Input: OK ___ Too Much ___ Too Little ___
   Locked brakes and lost steering control: Yes ___ No ___
   Hit cones: Yes ___ No ___
   Overall Performance: Good ____ Average ____ Poor ____
   Comments:

---

3. Speed: _____
   Reaction Time: Quick ____ Average ____ Slow ____
   Hand Position: OK ___ Needs Improvement ____
   Released Throttle: Yes ___ No ___
   Steering Input: OK ___ Too Much ___ Too Little ___
   Locked brakes and lost steering control: Yes ___ No ___
   Hit cones: Yes ___ No ___
   Overall Performance: Good ____ Average ____ Poor ____
   Comments:

Criteria for Advancement/Mastery

Advancement: Instructor opinion; completion of at least two error-free runs at 30 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 35 mph.

UNIT 8

SKID CONTROL

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits necessary to operate a motor vehicle safely efficiently under normal driving conditions.

Rationale

The loss of traction can present serious problems for vehicle operators. Traction loss occurs when tires are no longer "geared" to the roadway surface. They are either spinning or skidding, making it difficult to control the vehicle. Of course, the best plan is to avoid this kind of situation by anticipating roadway conditions and driver actions that lead to traction loss, and correcting or compensating for them. Thus it seems that many drivers will, at some time or the other, find the need for knowledge and skill related to skid control. This exercise will give students the opportunity to practice the techniques for controlling a skid.

Lesson Objective

The student will develop a sense of feel for the behavior and control responses of the vehicle on a slippery road surface. The student will also learn the proper techniques necessary for controlling skids.

Specific Instructional Objective	Learning Activity
1. Given good skidding conditions the student will demonstrate a sense of feel for the behavior of the vehicle and perform proper techniques necessary to control skids.	1. The instructor will explain to the student the objective of the exercise and review the proper procedure for executing the exercise. 2. The instructor will demonstrate the maneuver so the student can get an idea of the type of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 position.
3. The student will enter the skid pad at an angle at a speed determined by the instructor.
4. With the vehicle at an angle, the instructor will initiate a skid.
5. The student should immediately begin to steer in the direction he/she wants the vehicle to go and simultaneously ease off the throttle. Timing is an important factor because corrective action must be taken before the crucial point of the skid.
6. As soon as the vehicle responds to the skid correction, the student must countersteer in the opposite direction until the front wheels are as straight as possible and

continue for a "second" skid if it should occur. In some cases, there may be a "third" or "fourth" skid and the student should be prepared to take the proper corrective action.

For high school students the exercise should be completed at the following speeds:

1. 20 mph
2. 25 mph
3. 30 mph (for advanced students and if time and space permits)

Exercise Layout

A skid pad at least 24 feet wide and 200 feet long. The pad area should include an approach lane 150 feet long and an exit lane of 150 feet. The surface is prepared by coating the road surface with a blacktop sealer to mask the fine scale texture of the road surface. A water source is necessary to provide a coat of water on the skid surface at all times. A water truck or a sprinkler system can be used. For the skid vehicle, a standard size four door passenger car equipped with standard tires can be used. The skids may be initiated in one of the following ways:

1. By using a seperate brake pedal on the instructor's side that will lock the rear brakes when applied.
2. By overapplying the throttle causing the rear wheels to spin.

3. By turning a sharp corner and causing a skid.
4. By a device placed on the park brake release lever to keep the park brake from remaining locked after being depressed.

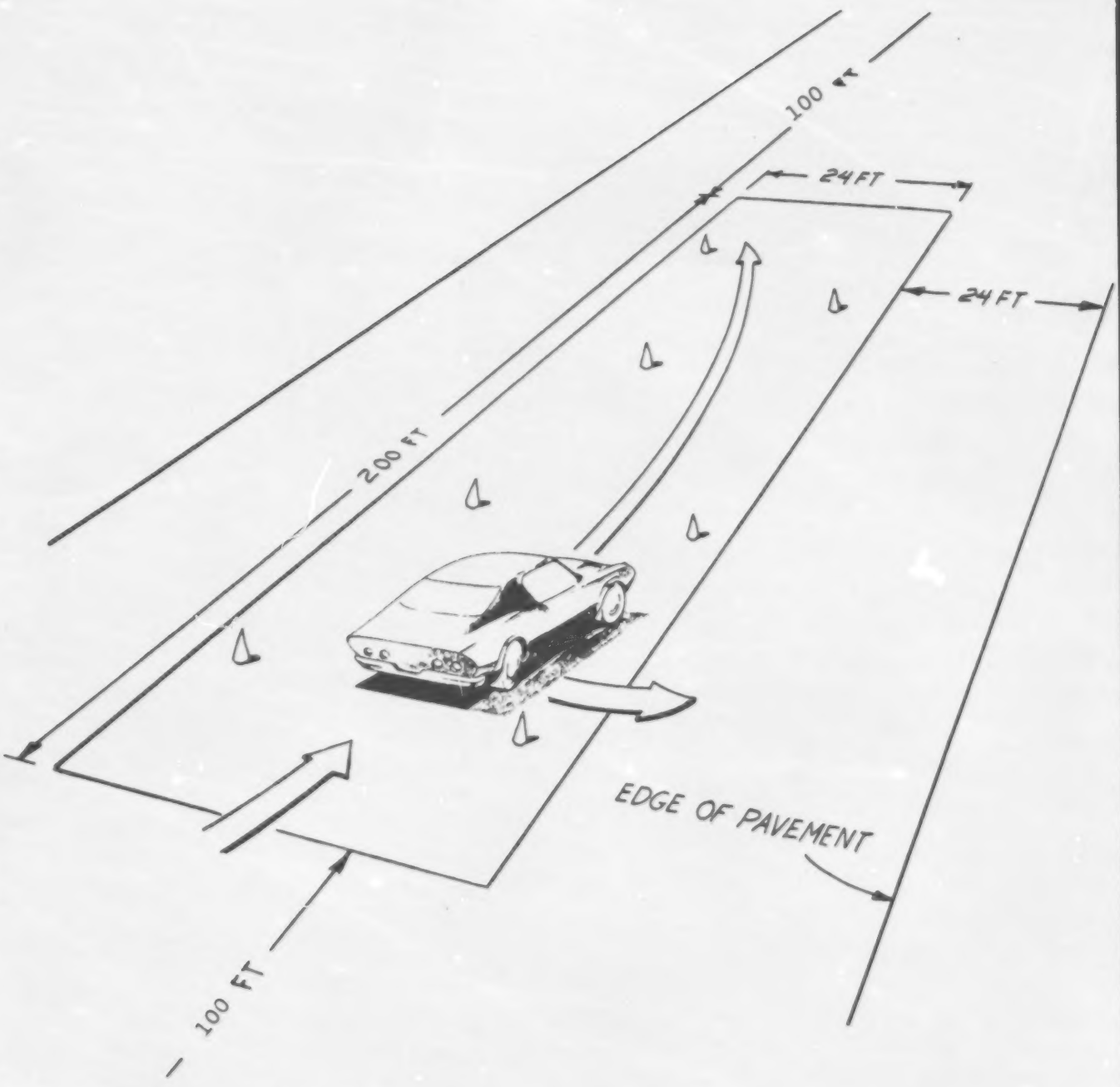
Evaluation

Instructor opinion; at least two runs at 25 mph should be completed to the satisfaction of the instructor.

Problem Areas

1. Does not ease up on the accelerator.
2. Hits the brakes and locks the wheels.
3. Tries to use the accelerator to control the skid.
4. Slow response to the first skid, allowing the vehicle to go beyond the point of control.
5. The student over-responds with too much steering to the first skid and cannot correct in time to catch the second skid.
6. The student will relax after correcting the first skid and not be prepared or aware of possible second skid.
7. Unable to distinguish which direction the back of the vehicle is skidding and either does nothing or turns in the wrong direction.
8. Panics and takes no action.
9. Exhibits improper hand control such as palming or throwing the steering wheel.

SKID CONTROL MANEUVER



STUDENT EVALUATION

Unit 8
Skid Control

Name _____
Date _____
Evaluator _____

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1. Speed: _____
   Reaction Time: OK ___ Slow ___
   Released Throttle: Yes ____ No ____
   Hit brake: Yes ____ No ____
   Steering Input: OK ____Too Early ____ Too Late ____
   Input Timing: OK ____ Too Early ____ Too Late ____
   Improper hand control: Yes ___ No ___
   Steers in wrong direction: Yes ___ No ____
   Hits cone(s): Yes ___ No ___
   Overall Performance: Good ____ Average ____ Poor ____
   Comments:

---

2. Speed:
   Reaction Time: OK ___ Slow ___
   Released Throttle: Yes ___ No ___
   Hit brake: Yes ___ No ___
   Steering Input: OK ____ Too Early ____ Too Late ____
   Input Timing: OK ____ Too Early ____ Too Late ____
   Improper hand control: Yes ___ No ___
   Steers in wrong direction: Yes ___ No ___
   Hits cone(s): Yes ___ No ___
   Overall Performance: Good _____ Average ____ Poor ____
   Comments:

Criteria for Advancement/Mastery

Advancement: Instructor Opinion; completion of at least two error-free runs at 25 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 30 mph.

UNIT 9

BLOW-OUT RECOVERY

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

Many drivers who experience a tire blowout lack the knowledge and skill necessary to cope with the situation. Obviously, the most serious problem with a tire blowout is the possibility that the driver will lose control of the vehicle. The results of tire failure need not be serious if the driver is adequately prepared to respond to the situation. This exercise is designed to provide students with the opportunity to develop the knowledge and skills necessary to effectively respond to a tire blowout.

Lesson Objective

The student will demonstrate how to control front and rear blowouts on a straight path and on curves.

Specific Instructional Objective	Learning Activity
1. Given a straight line of traffic cones 12 feet in width and a car equipped with a blowout simulator, the student will upon the blowing of the right front tire, keep the car within the 12 foot lane and slow the vehicle to a speed which	1. The instructor will explain to the student exactly what he is expected to accomplish with the exercise and make sure he understands what corrections he must make for this type of blowout.

would allow for a safe exit from the highway.

Remind students not to depress the brakes.

2. The instructor will demonstrate the blowout procedure.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. The student will proceed down the cone marked course at a speed selected by the instructor, usually 30 mph.
4. Midway in the course, the instructor will blow the right front tire.
5. The student should take his foot off the accelerator without braking and steer to the left just enough to maintain lane position. The steering left is necessary to overcome the pull to the right caused by the front tire increasing its rolling resistance.
6. After the student has slowed down and has control of the vehicle, brake to a stop.

For high school students the exercise should be accomplished at the following speed:

1. 30 mph

Exercise Layout

An approach lane 100 feet long leading to a 12 foot lane marked by cones on both sides, at least 200 feet in length. The

cones should be spaced about 6 feet apart. An outrun area of 100 feet should be provided.

Evaluation

Instructor opinion: at least two runs at 30 mph should be completed to the satisfaction of the instructor.

Problem Areas

1. Panic braking thereby losing steering control.
2. Steers too much causing the vehicle to leave the lane.
3. Does not steer for a front blowout and runs off to the right.
4. Student cannot determine which tire has blown and therefore steers in the wrong direction or does not steer at all.

Specific Instructional Objective	Learning Activity
2. Given a straight lane of traffic cones 12 feet in width and a car equipped with a blowout simulator, the student will upon the blowing of the right rear tire, keep the car within the 12 foot lane and slow the vehicle to a speed which would allow a safe exit from the highway.	1. The instructor will explain to the student exactly what he is expected to accomplish with the exercise and make sure he understands what corrections he must make for this type of blowout. Remind the student not to depress the brakes. 2. The instructor will demonstrate the blowout procedure.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position.

3. The student will proceed down the cone marked course at a speed selected by the instructor, usually 30 mph.
4. Midway in the course, the instructor will blow the right rear tire.
5. The student should take his foot off the accelerator, without braking, and hold the steering wheel straight. In this type of blowout if the driver steers right or left, he will cause the car to sway from side to side.
6. After the student has slowed down and has control of the vehicle, he will brake gradually to a stop.

For high school students the exercise should be accomplished at the following speed:

1. 30 mph

Exercise Layout

An approach lane 100 feet long leading to a 12 foot lane marked by cones on both sides, at least 200 feet in length. The cones should be spaced about 6 feet apart. An outrun area of 100 feet should be provided.

Evaluation

Instructor opinion: at least two runs at 30 mph should be completed to the satisfaction of the instructor.

Problem Areas

1. Panic braking thereby losing steering control.
2. Steers too much causing the vehicle to leave the lane.

3. Student cannot determine which tire has blown and therefore steers in the wrong direction or does not steer at all.

Note: After the student has acquired skill in straight-line blowouts, then run the course and blow the front and rear at random.

Specific Instructional Objective	Learning Activity
3. Given a left curved lane of traffic cones 12 feet in width and a car equipped with a blowout simulator, the student will, upon the blowing of the right front tire, keep the car within the 12 foot lane and slow the vehicle to a speed which would allow for a safe exit from the highway.	1. The instructor will explain to the student exactly what he is expected to do and make sure he understands what corrections he must make to control this type of blowout. Remind the driver not to depress the brakes as the tire blows. 2. The instructor will demonstrate the blowout procedure.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. The student will proceed down the cone marked curved course at a speed selected by the instructor, usually 25 mph.
4. In the curve, the instructor will blow the right front tire.
5. The student should take his foot off the accelerator, without braking, and he will have to increase his left steering input in order to maintain lane position. This

is necessary since the right front tire has increased its rolling resistance and lost its cornering ability, thereby creating a pull to the right.

For high school students the exercise should be accomplished at the following speed:

1. 25 mph

Exercise Layout

An approach lane 100 feet long leading to a 12 foot lane marked by cones set in a 175 foot radius. The cones should be spaced about 6 feet apart. The curve should be set in the opposite direction of the blowout unit (if the unit is mounted on the right, the curve should be set to the left). This course layout will provide the most serious blowout situation. The speed should be kept at 25 mph on this type radius curve.

Evaluation

Instructor opinion: at least two runs at 25 mph should be completed to the satisfaction of the instructor.

Problem Areas

1. Panic braking, thereby losing steering ability.
2. Does not add left steer on a right front blowout, running into the oncoming lane.
3. Steers too much to the left on a front blowout, running into the oncoming lane.
4. Does not steer at all, but just holds the wheel straight

and runs to the right off the course.

5. The driver does not get his foot off the accelerator pedal.

6. Student cannot determine which tire has blown, therefore steers the wrong way.

Specific Instructional Objective	Learning Activity
4. Given a left curved lane of traffic cones 12 feet in width and a car equipped with a blowout simulator, the student will, upon the blowing of the right rear tire, keep the car within the 12 foot lane and slow the vehicle to a speed which would allow for a safe exit from the highway.	1. The instructor will explain to the student exactly what he is expected to do and make sure he understands what corrections he must make to control this type of blowout. Remind the student not to apply the brakes as the tire blows. 2. The instructor will demonstrate the blowout procedure.

Content

1. Be sure the restraint system is securely fastened.

2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.

3. The student will proceed down the cone marked curve course at a speed selected by the instructor, usually 25 mph.

4. In the curve, the instructor will blow the right rear tire.

5. The student should take his foot off the accelerator, without braking, and he will have to take some of the

left steering out in order to correct for the skid started by the blown rear tire. As soon as he has corrected the skid, he will then add more left steer in order to maintain lane position.

6. After the student has slowed down and has the vehicle under control, he will brake gently to a stop.

For high school students the exercise should be accomplished at the following speed:

1. 25 mph

Exercise Layout

An approach lane 100 feet long leading to a 12 foot lane marked by cones set in a 175 foot radius. The cones should be spaced about 6 feet apart. The curve should be set in the opposite direction of the blowout unit (if the unit is mounted on the right the curve should be set to the left). This course layout will provide the most serious blowout situation. The speed should be kept at 25 mph on this type curve.

Evaluation

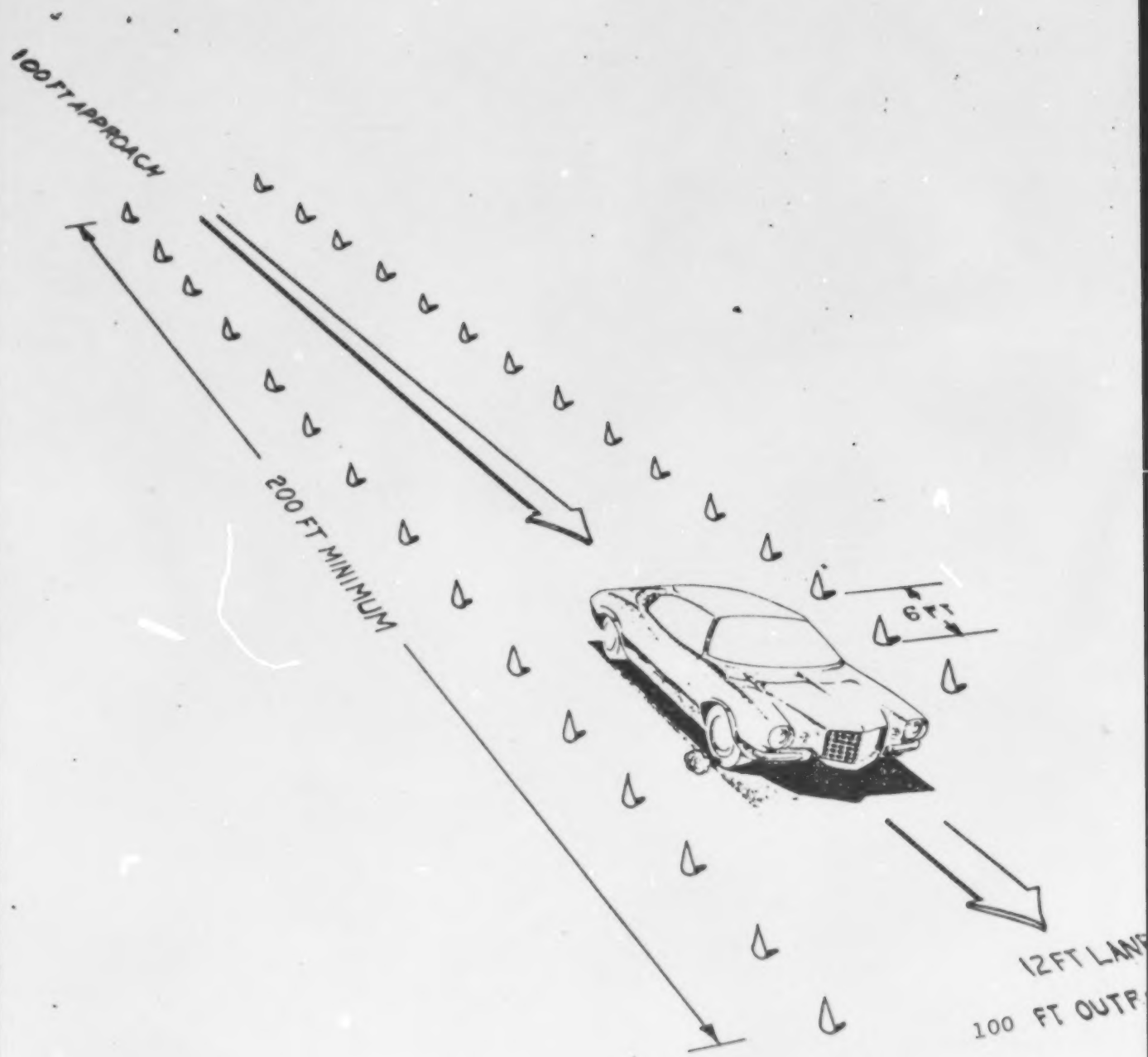
Instructor opinion: at least two runs at 25 mph should be completed to the satisfaction of the instructor.

Problem Areas

1. Panic braking, thereby losing steering ability.
2. Steers too much in both directions on a rear blowout, causing the car to spin out.

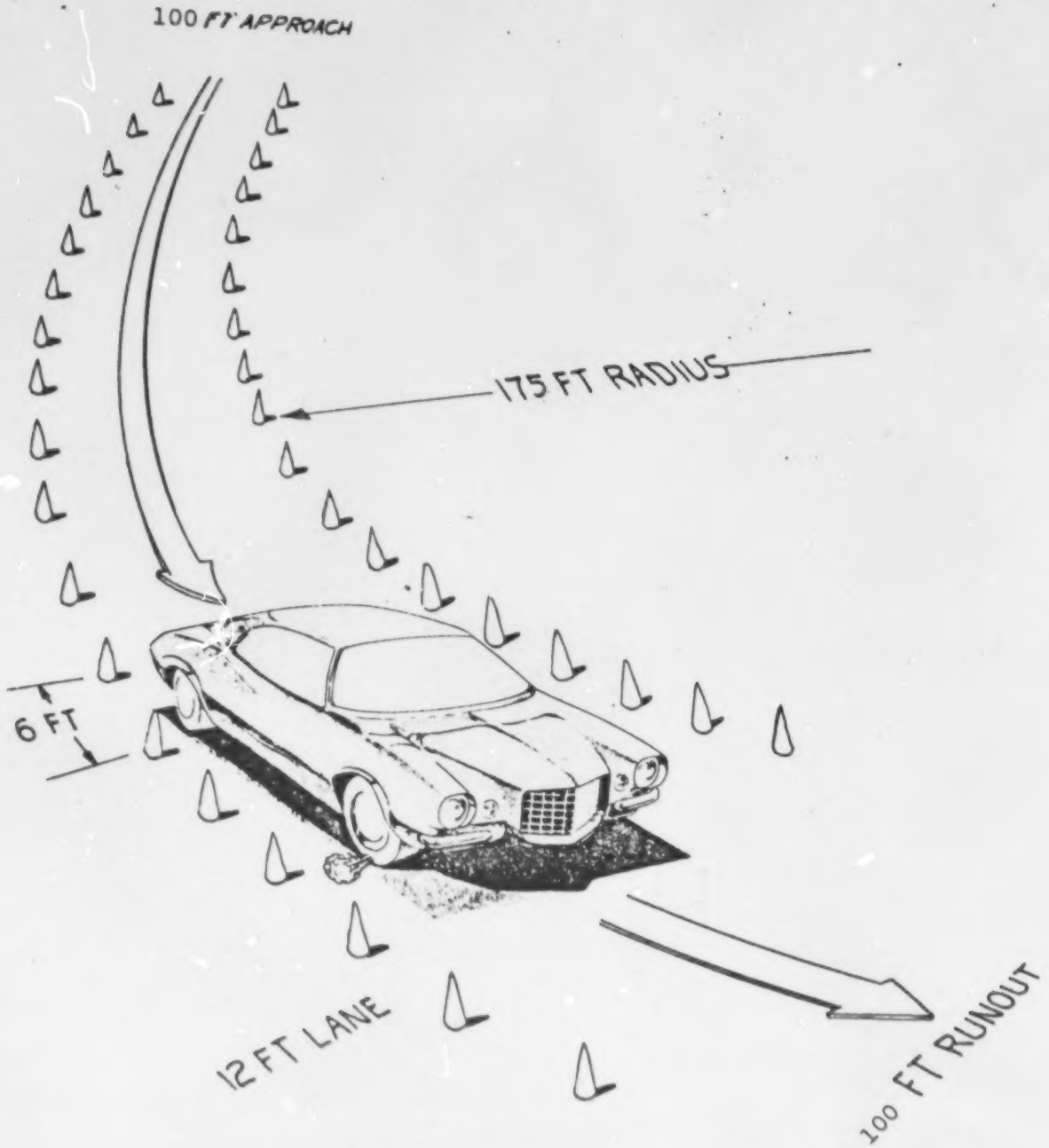
3. Does not correct for the skid started by the right rear blowout and spins out of the curve.
4. Does not steer at all, but just holds the wheel straight and runs to the right of the course.
5. Does not get his foot off the accelerator pedal.
6. Student cannot determine which tire has blown, therefore, steers the wrong way.

STRAIGHT LINE BLOWOUT



81

BLOWOUT IN A CURVE



STUDENT EVALUATION

Unit 9
Blowout Recovery

Name _____
Date _____
Evaluator _____

---

1. Speed: _____
   Check one: Straight line ____ Blowout in a curve ____
   Check one: Front tire ____ Rear tire ____
   Released Throttle: Yes ___ No ___
   Panic Brakes: Yes ___ No ___
   Proper steering input: Yes ___ No ___
   Hits cone(s): Yes ___ No ___
   Overall Performance: Good ____ Average ____ Poor ____
   Comments:

---

2. Speed: _____
   Check one: Straight line ___ Blowout in a curve ___
   Check one: Front tire ____ Rear tire ____
   Released Throttle: Yes ___ No ___
   Panic Brakes: Yes ___ No ___
   Proper steering input: Yes ___ NO ___
   Hits cone(s): Yes ___ No ___
   Overall Performance: Good ____ Average ____ Poor ____
   Comments:

Criteria for Advancement/ Mastery

Advancement: Instructor opinion; completion of at least two error-free runs at 30 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 30 mph.

Instructor note: The above criteria is for straight line blow-outs. For blowouts in a curve, 25 mph should be the speed used to measure for advancement/mastery.

UNIT 10

LEFT-RIGHT EVASIVE ON A WET SURFACE

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits necessary to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

The stopping distance of a vehicle is increased when the road surface is wet. Under these circumstances, evasion of an obstacle or barrier may be a better solution than braking to avoid the obstacle. However, this action, if not properly done, could result in the driver losing control and going into a skid. This exercise is designed to provide students with the opportunity to practice evading a barrier on a wet surface.

Lesson Objective

The student will demonstrate the ability to evade a barrier on a slick wet surface and maintain control of the vehicle.

Specific Instructional Objective	Learning Activity
1. Given a 12 foot wide lane of traffic cones and a barricade placed 50 feet from a double cue cone, the student will be able to evade the barricade either to the left or right, depending upon the command of the instructor. The student must not hit any cones and maintain lane	1. The instructor will explain to the student the objective of the exercise and review the proper procedure for performing the exercise. 2. The instructor will demonstrate the maneuver so that the student can get some idea of the type

position after evading the barricade.

of skill he is trying to develop.

Content

1. Be sure the restraint system is securely fastened.
2. Be sure the student has assumed the proper driving position; hands at 9 and 3 on the steering wheel.
3. The student should accelerate down the approach lane at a speed determined by the instructor.
4. At the double cue cone the student will attempt to evade the barricade without braking. The direction and initiation of the maneuver will be determined by the instructor, using a verbal command of right or left.
5. The student must turn the steering wheel sharp left or right (depending upon instructor's command) to evade the barricade and release the accelerator gradually. Do not use the brake.
6. The student should turn the steering wheel the same amount in the opposite direction to stay in the proper lane.
7. The student should brake to a stop and repeat the exercise until the instructor is satisfied with his performance.

For high school students the exercise should be completed at the following speeds:

1. 20 mph
2. 25 mph
3. 30 mph
4. 35 mph (for advanced students and if space and time permits)

Exercise Layout

The course should consist of an approach lane 12 feet wide and at least 200 feet long leading toward a cone barrier. It should include a 12 foot leadout lane on either side of the barrier and extend for 50 feet. A double cue cone is set 50 feet from the barrier in the approach lane. This double cue cone serves as a cue point. Spacing between cones on the leadout lane is 6 feet. There should be an outrun area about 150 feet long.

Evaluation

The student should repeat the exercise with the instructor giving the direction cue at random until he is satisfied that the student has acquired the skill to perform an effective evasive maneuver on a wet surface. At least two error-free runs at 30 mph should be completed.

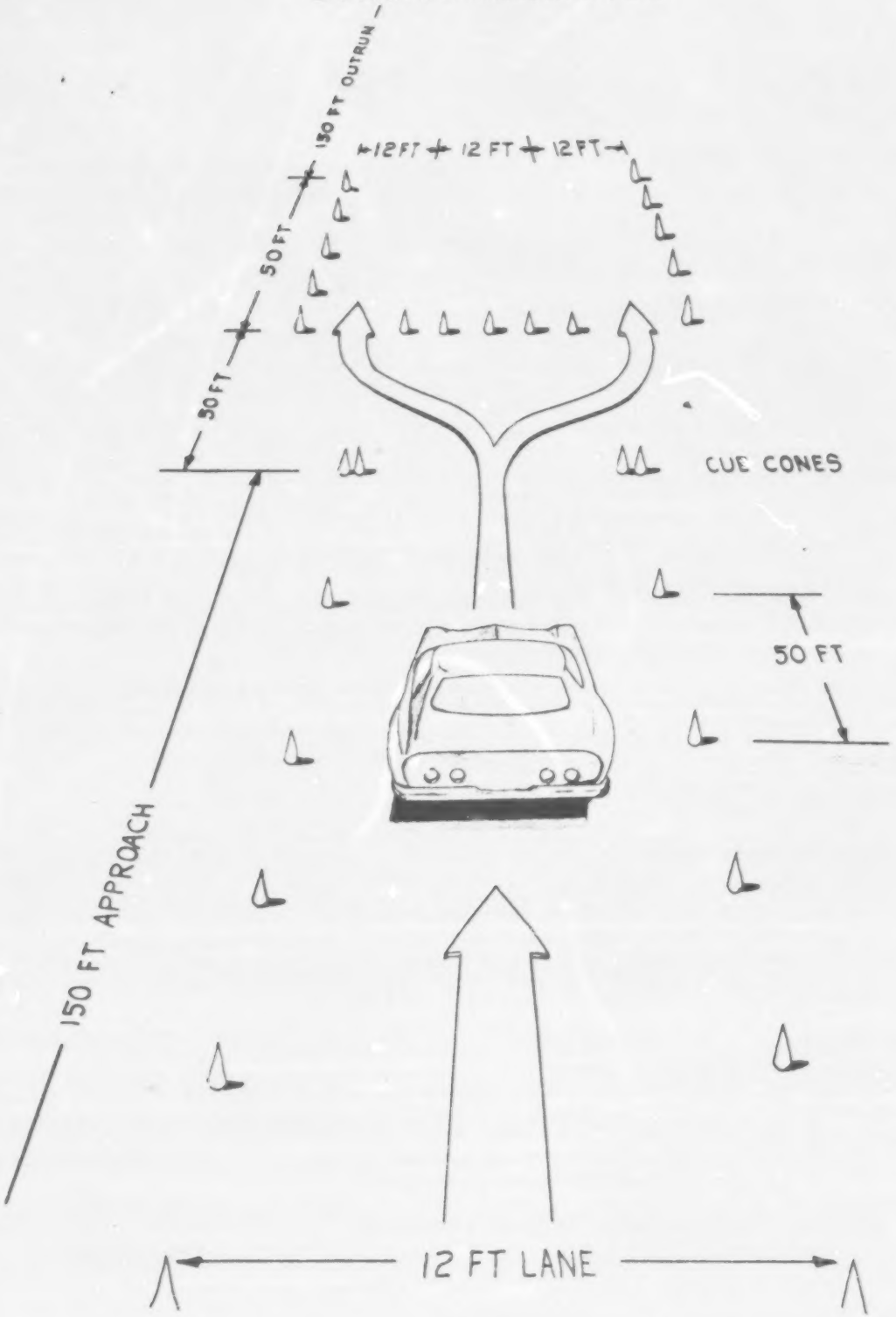
Problem Areas

1. Turns wrong way each time--usually anticipating the direction.
2. Steers and/or countersteers late--wipes out the course.
3. Overapplies throttle.
4. Poor hand position--fights the steering wheel.
5. Panic brakes and slides through the barrier.
6. Oversteers, causing the vehicle to skid.
7. Attempts to go in wrong direction and then tries to

recover. Once the student has committed the vehicle in one direction he should continue in that direction. He cannot recover in time to make any corrections.

LEFT-RIGHT

EVASIVE MANEUVER



STUDENT EVALUATION

Unit 10
Left-Right Evasive on
a Wet Surface

Name_____
Date_____
Evaluator_____

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1. Speed:____
   Reaction Time: Quick____ Average____ Slow____
   Hand Position: OK____ Needs Improvement____
   Hits Brake: Yes____ No____
   Released Throttle: Yes____ No____
   Anticipated Direction of Command: Yes____ No____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Lane Position Maintained: Yes____ No____
   Hits cone(s): Yes____ No____
   Handles skid properly if it occurs: Yes____ No____
   Overall Performance: Good____ Average____ Poor____
   Comments:

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2. Speed:____
   Reaction Time: Quick____ Average____ Slow____
   Hand Position: OK____ Needs Improvement____
   Hits brake: Yes____ No____
   Released Throttle: Yes____ No____
   Anticipated Direction of Command: Yes____ No____
   Steering Input: OK____ Too Much____ Too Little____
   Input Timing: OK____ Early____ Late____
   Lane Position Maintained: Yes____ No____
   Hits cone(s): Yes____ No____
   Handles skid properly if it occurs: Yes____ No____
   Overall Performance: Good____ Average____ Poor____
   Comments:

Criteria for Advancement/Mastery

Advancement: Instructor opinion; completion of at least two error-free runs at 30 mph.

Mastery: Instructor opinion; completion of four out of six error-free runs at 30 mph.

UNIT 11

OTHER EMERGENCY SITUATIONS

Required Entry Level

The student will have demonstrated all SIPDE skills and correct pre-driving habits necessary to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

Unit one explained the importance of vehicle inspection to avoid malfunctions of its equipment. However, these inspections can not always detect potential problem areas. This unit is designed to provide the driver with knowledge necessary to control a moving vehicle when some of these failures/emergencies cccur.

Lesson Objective

The student will be able to control the vehicle safely and effectively when failure of brakes, steering and accelator occur. Also the student will know the proper procedures for handling a fire, impaired vision and physical problems which occur within the vehicle.

Specific Instructional Objective	Learning Activity
1. The student will have mastered necessary procedures of handling brake failures on a vehicle.	1. The instructor will discuss and describe the procedures of controlling the vehicle when brake failure occurs. Also the importance of steering and the environment to slow the vehicle. 2. The instructor will demonstrate how to effectively slow down and stop.

Content

Brake failure is a serious situation, not only for yourself but for the other people who are unaware of the problem. It is important not to panic. Let people know of your problem by flashing your headlights, sounding your horn, and using your emergency flashers. If the brakes fail while you are driving, first try your parking brakes. Secondly, you should down shift. Other measures of slowing the vehicle can be rubbing the tires of the vehicle against the curb, using the shoulder of the road or an open field.

Evaluation

The student will have mastered the proper procedures in slowing and stopping the vehicle without using the brakes.

Specific Instructional Objective	Learning Activity
2. The student will be able to steer a vehicle in a predetermined path during steering failure.	1. The instructor will discuss and describe the procedure of how to steer a vehicle when there is steering failure. 2. The instructor will demonstrate how to effectively steer a vehicle when steering failure occurs.

Content

Power steering failure is caused by mechanical breakdown, belts breaking, loss of power steering fluid, or by engine failure. Usually the driver is warned before the system fails especially by excessive play in turning the steering wheel.

If the engine system fails, your power steering will become extremely difficult to turn. It is important to note that you can receive easier steering if the car is left in gear to utilize the drive train to keep the engine turning.

If complete steering is lost, the driver should stop the vehicle as safely and as soon as possible. If difficult steering is the problem, the correct procedure to follow during this failure is to grasp the steering wheel firmly with both hands, slow the vehicle, and pull off the road to a safe area.

Evaluation

The student will drive the vehicle in a predetermined path when the engine system fails.

Specific Instructional Objective	Learning Activity
3. The student will explain the proper procedure for when the accelerator gets stuck.	1. The instructor will explain and demonstrate the proper procedures the student will follow when the accelerator gets stuck.

Content

A stuck accelerator may present a very dangerous situation for the driver. The correct procedures should be done as quickly as possible to avoid this hazardous problem. The driver should turn off the ignition, brake gradually, (down shift if possible) and leave the roadway at the first safe opportunity.

Evaluation

The student will explain the proper procedure to be followed when the accelerator gets stuck.

Specific Instructional Objective	Learning Activity
4. The student will explain what proper action should be taken if a fire started inside the vehicle.	1. The instructor will discuss procedure in coping with a fire inside the vehicle.

2. The instructor will explain the proper procedures for leaving the road in case of fire.

Content

Fire inside an automobile is a serious problem no matter its size, from a fire in the ash tray to a fire caused by faulty electrical wiring. It is important to quickly and safely stop the vehicle out of the traffic lane and extinguish the fire. The driver should not try to extinguish the fire while the vehicle is in motion, but slow down as quickly as possible, leave the roadway and turn off the ignition. There are several ways of extinguishing a fire, for example, a fire extinguisher, smothering the blaze, or removing the burning materials from the vehicle. Safety must be considered when dealing with a fire in a vehicle.

Evaluation

The student will list the correct procedures for coping with a fire inside a vehicle.

Specific Instructional Objective	Learning Activity
5. The student will identify the correct procedures for emergency actions when vision is imparied.	1. The instructor will identify several emergency situations which may occur due to imparied vision.

2. The instructor will describe the correct response for each emergency.

Content

Impaired vision can be very dangerous for the motorist. Glare, hood flying up, loss of headlights during night driving, or the windshield fogging up are a few examples of how vision may be impaired.

Often glare can be reduced by wearing sunglasses or shading the eyes, however, if glare or reflections do occur, the driver should avoid looking at it, slow the vehicle, and if required leave the roadway to correct the situation. If the hood flies up the driver should slow the vehicle, look either between the hood and the dash or out the left side window, steer the vehicle to the road side, stop and secure the hood. If the headlights fail the driver should slow the vehicle, look for objects that will aid in getting oriented, try the switches to see if other lights are working, steer off of the road and stop. If the windshield becomes fogged up or obscured for any reason, the driver should slow the vehicle, look out the left side window, pull off the road and correct the situation.

Evaluation

The student will list several potential ways the driver's vision may be impaired while driving.

Specific Instructional Objectives	Learning Activity
6. The student will identify potential physical problems or distractions which may require emergency action.	1. The instructor will identify several potential physical problems or distractions for the student driver.

Content

Sickness or physical problems are often easy to detect so an emergency should be avoided. However, if a situation should arise the driver should not panic and lose control of the vehicle. Muscle cramp, vomiting and coughing are examples of physical problems. An example of a distraction could be a dropped cigarette or a bee in the vehicle. Slowing the vehicle and pulling off the road safely is the correct response so the driver can correct the situation.

Evaluation

The student will list the correct procedure for handling a distraction within the vehicle.

UNIT 12

TIRES

Required Entry Level

The student will have demonstrated all SIPDE skills and pre-driving habits necessary to operate a motor vehicle safely and efficiently under normal driving conditions.

Rationale

Automobile tires perform an important function in driving. They provide the traction which allows the driver to maneuver the automobile. Because of their importance every driver ought to have some knowledge of their construction and maintenance in order to keep their car in safe operating order.

Lesson Objective

The student will develop knowledge of construction and maintenance of tires.

Specific Instructional Objective	Learning Activity
1. The student will be able to distinguish between the construction of radial, bias and bias belted tires.	1. The instructor will discuss with the use of overhead projector materials, the construction and differences between radial, bias and bias belted tires.

Content

Bias

1. Bias tires are one of the oldest established type.
2. There are two or more layers of unwoven fabric (cord).
3. The bead is a fairly stiff hoop of strong wire embedded in rubber sewing to prevent the tire from stretching and leaving the rim.
4. The cords run from one rim head to the other.
5. The layers of fabric are superimposed so that their diagonals are inclined in opposite directions.
6. When the cords are at an angle approaching the circumference direction of the tread the tire will give good stability and steering response but a harsh ride.

Bias Belted

1. Bias belted is similar to that of the bias ply tire plus two or more circumference belts under the tread.
2. These outer belts reduce the tread motion during contact with the road, thus improving tread life.

Radial

1. Purpose of radial tires are divided into two parts.
   A. desired ride qualities
   B. necessary directional qualities
2. The cords of a radial tire run radially from bead to bead. (Crossing the crown of the tire at right angles)
3. This type of construction gives little or no directional stability.
4. This is corrected by additional belts that run circumference around the carcass of the tire.
5. The belts are at least two layers.

Evaluation

The student will be able to orally explain and/or write about the construction difference between bias, bias belted and radial tires.

Specific Instructional Objective	Learning Activity
1. The student will understand the transmission of traction and cornering forces of radial tires.	1. The instructor will explain traction and cornering forces of radial tires.

Content

1. The contact patch is larger with radial tires.
2. Radial tires give greater flexibility than sidewalls.

3. With greater contact patch, the ground pressure is slightly lower but more evenly distributed.

4. By having more rubber on road, distribution of the weight greater, you receive better traction.

Cornering

1. The flexible sidewalls of radial can bend with the load.

2. The original contact area is kept.

Evaluation

The student will be able to explain the transmission and cornering forces of radial tires.

Specific Instructional Objective	Learning Activity
1. Given a tire, a student will be able to interpret the side symbols of the tire.	1. The instructor will bring in different types of tires and visual aids to show the difference between different types of tires.

Content

1. There are three ways to designate the size of tires.

Example 1 7.75-14

A. The first number, 7.75 denotes the width of inflated tires at the contact point in inches.

B. The second number, 14 shows the diameter size of rim needed.

Example 2 F 70-40

A. A through J designates the contact tread size.

B. A is the smallest size of tread up through J being the largest.

C. The 70 means the tire is 70% as high as it is wide.

D. 14 designates the size of the rim needed.

Example 3 195 UR 14

A. The 195 represents the inflated tire contact patch in millimeters.

B. The U, is the rating of the tire in regard to speed.

C. The R means that the tire is of radial design.

D. The 14 designates the size (diameter of wheel) of the rim needed in inches.

2. The load rate of a tire is identified by the letters B,C,D. This designates their particular load inflation limits and service requirements.

Load Range B - 4-ply rating

Load Range C - 6-ply rating

Load Range D - 8-ply rating

3. Each tire is numbered with a serial number and registered through the Department of Transportation.

Evaluation

Given a tire, the student will be able to tell what size and load rating the tire is.

Specific Instructional Objective	Learning Activity
1. The student will understand the advantage of good tire treads versus worn tires with regard to proper inflation and how this effects the stopping capacity and wear of tires.	1. The instructor will show pictures of underflated, overinflated, and properly inflated tires.

Content

1. Proper inflation is the most important rule in tire safety and tire mileage.
2. Without proper inflation the useful life of the tire is drastically reduced.
3. You should check tire inflation every few weeks.
4. Check pressure of tires when tires are cool (driven less than one mile at moderate speed).
5. Never "bleed" or reduce air pressure when tires are hot.
6. When the tires wear in the center it means the air pressure is too high.
7. When the tire wears on the outside, it means the tire is underinflated.

Vehicle Stopping

1. On wet roads, new tires stop cars shorter than worn tires.
2. The water is channeled through the tire so that the hydroplanning effect is minimized.
3. On wet roads when 50% of tire tread is gone, traction decreases significantly.

Evaluation

The student will write or orally explain the advantages of proper inflated tires and the advantage of having good tires for wet road driving.

UNIT 13

MULTIPLE-CAR OFF STREET DRIVING RANGE MODIFICATIONS

It is recognized that not all schools have driving ranges available to them. Thus the following suggestions are given for the teaching of evasive and emergency driving maneuvers for schools with limited off street facilities.

Possible areas for teaching evasive and emergency maneuvers on modified ranges include:

1. Abandoned or closed street or highway
2. School parking lot
3. Shopping center parking area
4. Church parking lot
5. Closed or abandoned airport runway
6. Industrial parking lot
7. Military installations
8. Recreational areas--city park, county park, etc.

Facilities

In the absence of a multiple car driving range, any paved area 600 feet by 600 feet is adequate to conduct all exercises described at speeds of 25 to 35 mph. All of the previously mentioned areas could be used. However, safety measures must be taken into consideration.

Regardless of the type of area, the minimum paved space

required is 400 feet by 50 feet. The recovery area should be adjacent to the pavement level and should be free of obstacles. This extra space is necessary in case a vehicle should leave the paved surface. Using an area of this limited size, it will allow you to teach only serpentine maneuvers, straight-line blowouts, and controlled braking.

In order to teach evasive maneuvers, off-road recovery, and skids, the width of the area must be at least 100 feet. Using an area of this size, only one exercise should be taught at a time.

When using an area not owned by the local school, written permission should be secured from the owner. In addition, appropriate caution signs should be erected. It is suggested that all entrances to this area be blocked to prevent entry by other vehicles.

The same safety precautions must be observed on a modified range just as they are on any facility.

1. The area must be flat, free of dips or bumps, and have sufficient grade to allow water to run off the surface. A 1% grade is recommended. Center drains should not be on the surface.
2. The driving and surrounding areas must be free of curbing and obstacles.
3. The driving area should be paved with concrete or asphalt.

4. A minimum of fifty feet between exercises should be maintained.
5. Speeds must be adjusted to fit the facility.
6. Sufficient space must be allowed to perform the maneuver safely.

The instructor should be aware that modifications can be made. Following are some suggestions in range modifications:

1. Decrease the standard distance between cones in the maneuver. This will decrease the maximum speed at which the maneuver may be successfully completed. (Refer to Appendix A in back of book for recommended speeds and distance.)
2. Place the maneuvers closer than the recommended 50 feet distance and use only one vehicle.
3. Use one maneuver for part of the period, then change to a different maneuver. Often high school instructors will not be able to complete more than one exercise per period.

The instructor will have to decide what modifications best suit his facility. He must consider safety first when modifications are being used.

Modified Exercise Layouts

The recommended layout for each of the exercises is included in each unit. However, since many of the schools do not have

an area this large, modifications to the exercise layouts have been made. A suggested modified layout for each exercise follows:

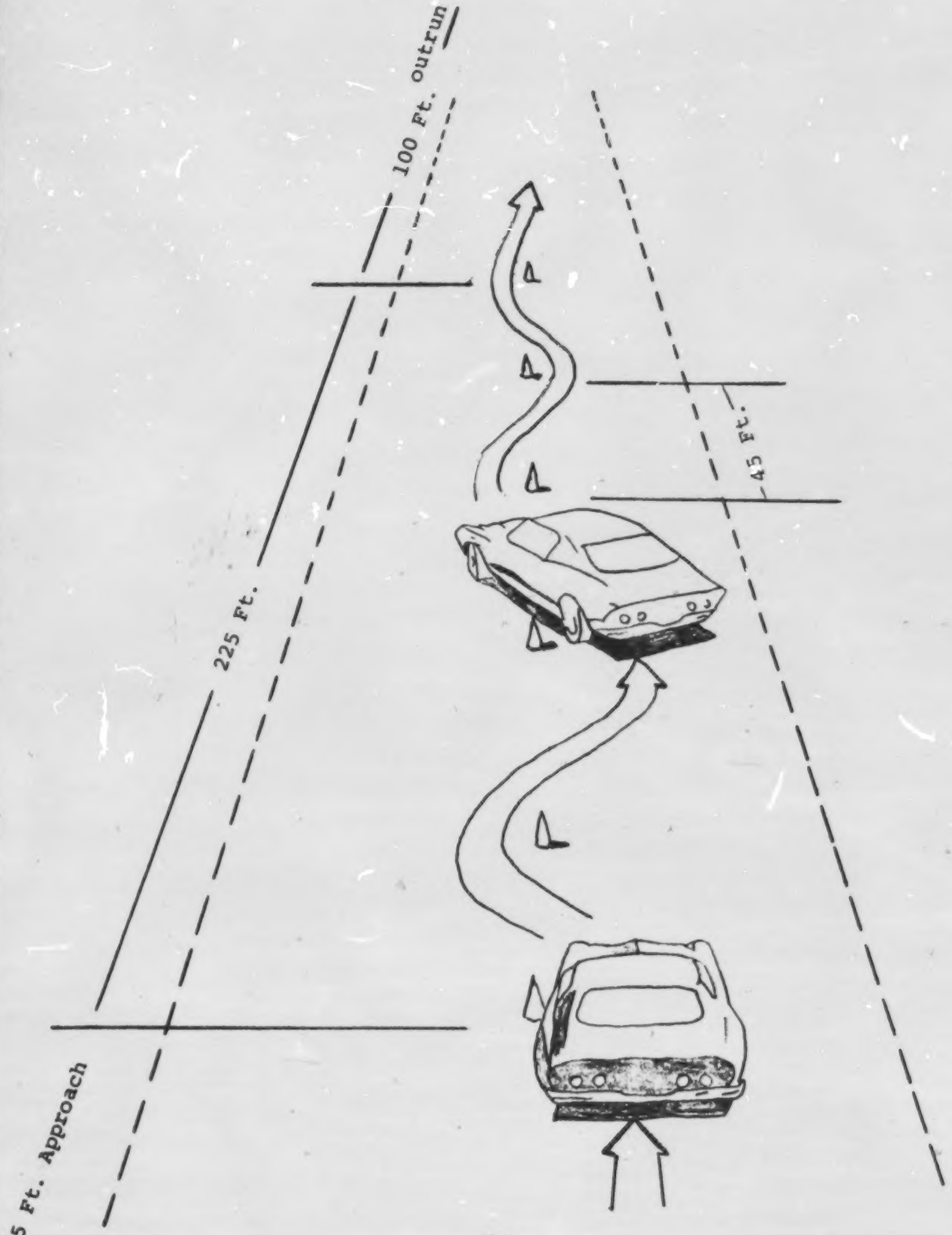
MODIFICATIONS FOR
UNIT 3

SERPENTINE

Modified Course Layout

An approach lane 75 feet long leading to a straight line of cones set 45 feet apart for a length of 200 feet. If the cone spacing is less than 45 feet the 9-3 steering cannot be used which then defeats part of the purpose for the exercise. A full lane of 12 feet should be available on either side of the serpentine course. An outrun area of 100 feet is desirable. It is recommended that 20-25 mph be the maximum speed with this layout.

MODIFIED COURSE LAYOUT



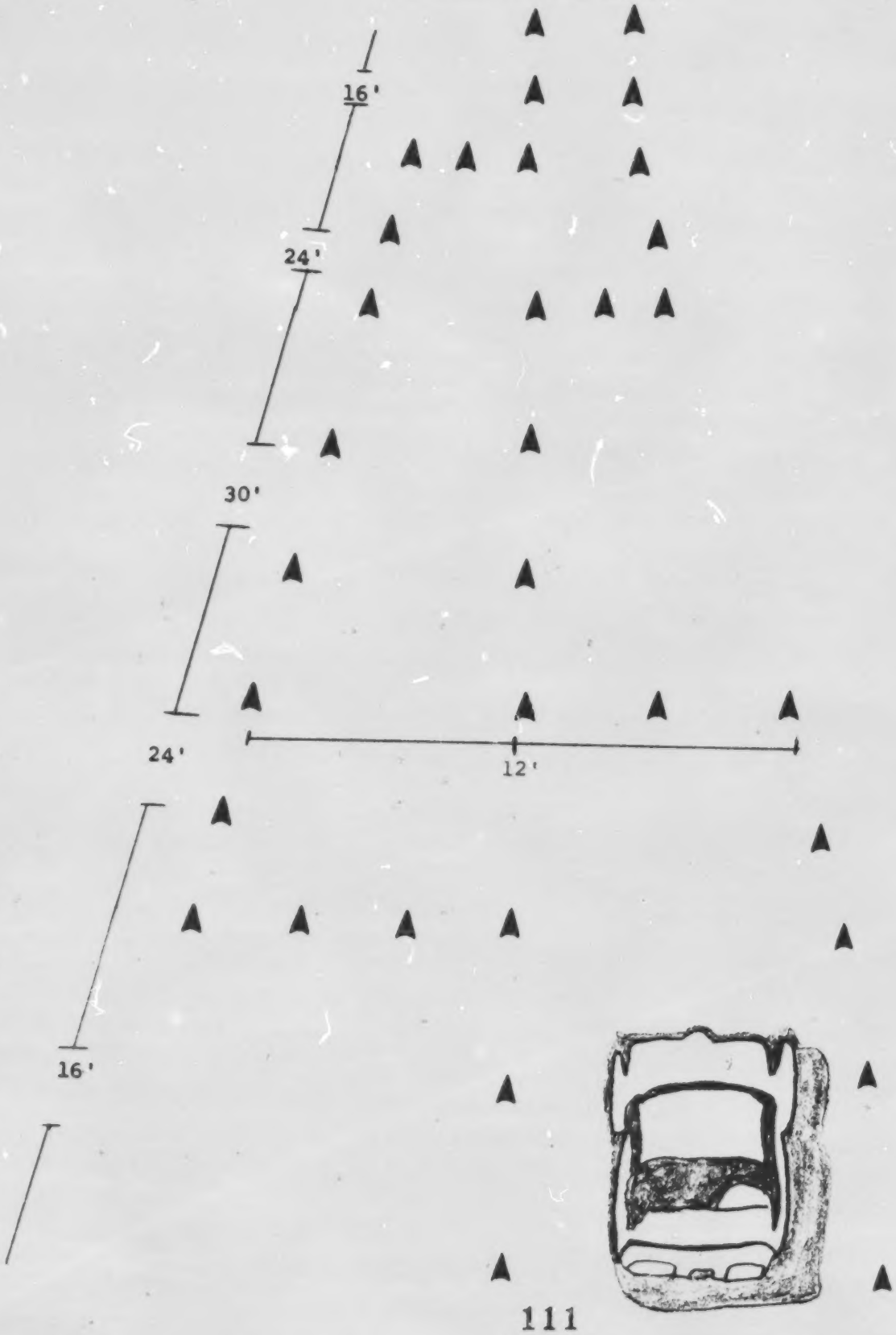
MODIFICATIONS FOR
UNIT 4

OFF-SET

Modified Course Layout

The approach lane is 16 feet long and 12 feet wide with a left lane change area of 24 feet long and 24 feet wide. The left lane is 30 feet long and 12 feet wide with a right lane change area 24 feet long and 24 feet wide. The outrun area is 16 feet long and 12 feet wide

MODIFIED COURSE LAYOUT



MODIFICATIONS FOR
UNIT 5

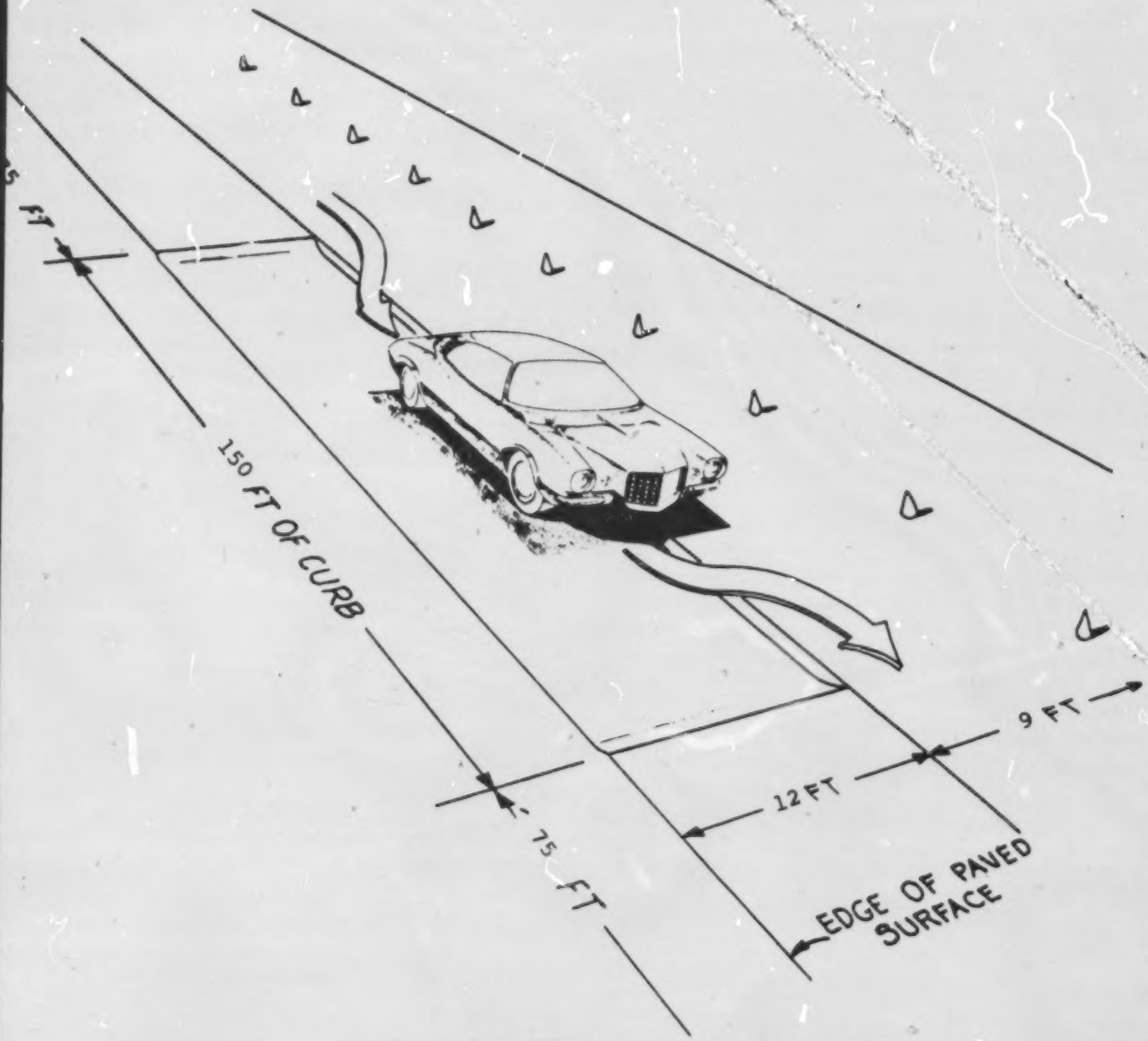
OFF-ROAD RECOVERY

Modified Course Layout

An approach lane 75 feet long, 150 feet of 4-inch curbing and a 75 foot outrun lane. A 12 foot lane adjacent to the curbing between the curb and the edge of the paved area is recommended. The nine foot lane adjacent to the curbing should be marked by cones 6 feet apart. An asphalt surface is usable although it is recommended that the drop-off edge be of concrete. The actual drop-off area (4") may consist of loose dirt, sand, gravel, packed dirt, clay, etc. The speed at which this exercise could be conducted would range between 15 and 25 mph depending upon the facilities. With this layout it is suggested that only the two-wheel drop-off be used.

OFF-ROAD RECOVERY

MODIFIED COURSE LAYOUT



MODIFICATIONS FOR
UNIT 6

LEFT-RIGHT EVASIVE

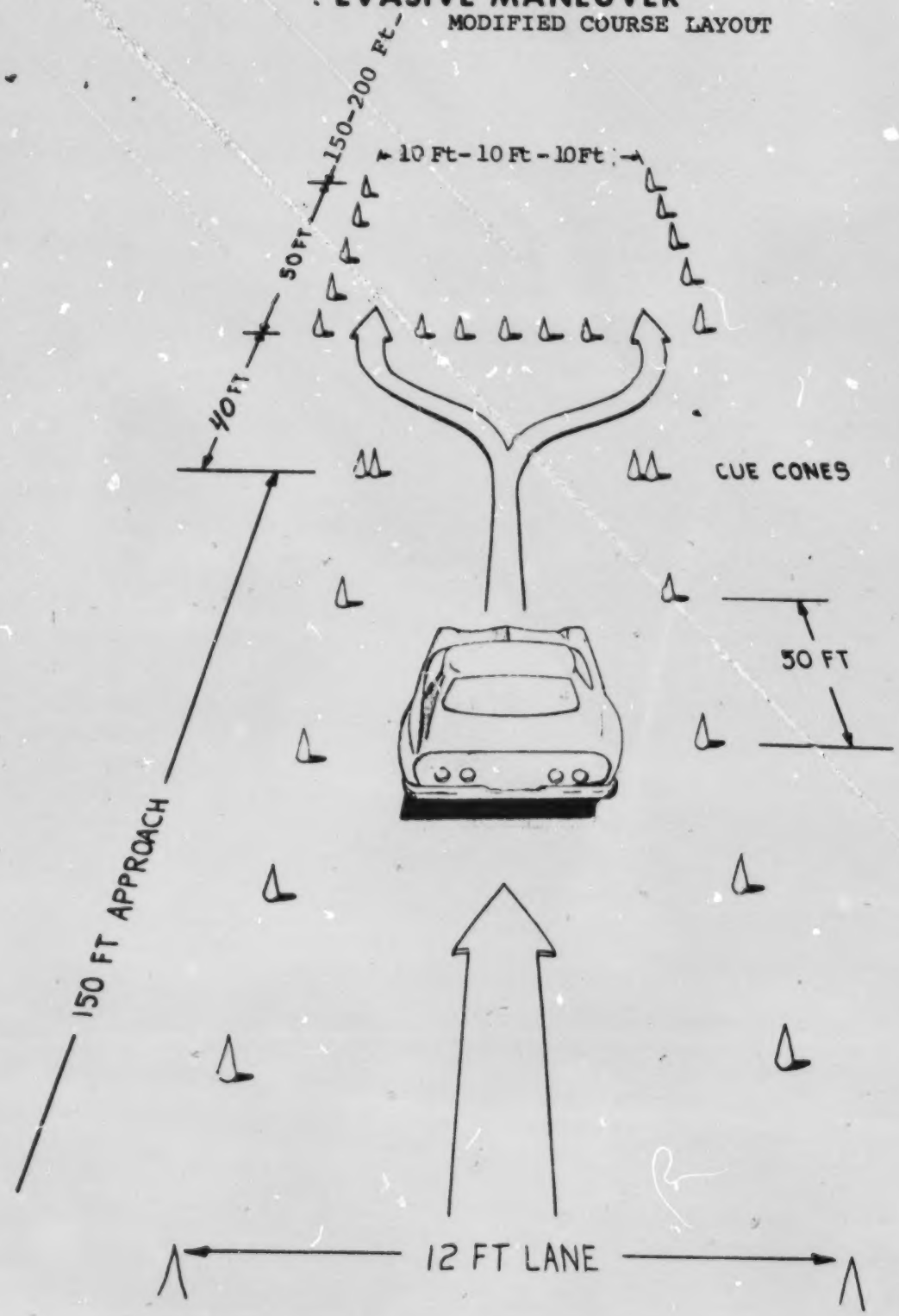
Modified Course Layout

An approach lane 12 feet wide and 150 feet long leading toward a cone barrier. It should include a 10 foot wide run-out lane on either side of the barrier and extend for 50 feet. A double cue cone is set 40 feet from the barrier in the approach lane. This double cue cone serves as a cue point. Spacing between cones on the approach lane is 50 feet and spacing between cones on the run-out lane is 6 feet. The outrun area should be about 150-200 feet long. Maximum speed should be 30 mph.

LEFT-RIGHT

EVASIVE MANEUVER

MODIFIED COURSE LAYOUT



MODIFICATIONS FOR
UNIT

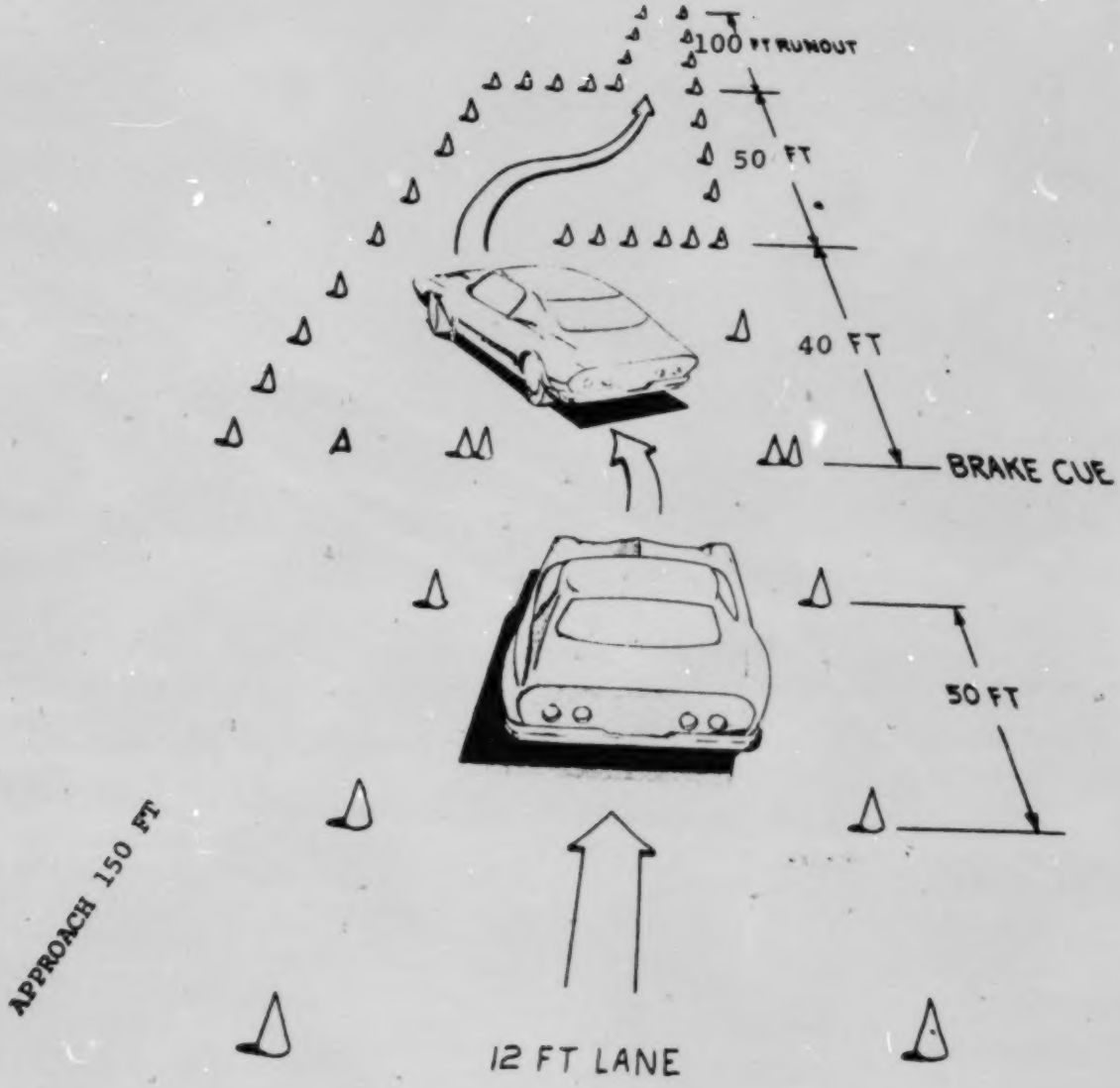
CONTROLLED BRAKING

Modified Course Layout

An approach lane 150 feet long and 12 feet wide leading to a cone barrier. A double cue cone is placed on the approach lane 40 feet from the barrier. A left lane, 12 feet wide, adjacent to the approach lane, starting 40 feet from the barrier and extending 50 feet beyond the barrier with the ends closed. An outrun lane should be about 100 feet. Maximum speed should be 25-30 mph.

CONTROLLED BRAKING

MODIFIED COURSE LAYOUT



MODIFICATIONS FOR
UNIT 8

SKID CONTROL

Modified Course Layout

When using a paved area other than a skid pad, it will probably be necessary to surface the area with a removable lubricant such as straw, sawdust, soapy water, etc. This should provide a slippery surface for conducting skids. A parking lot covered with snow or rain would be a good area for this exercise. The instructor should practice on the area selected before using it as a teaching area with students.

MODIFICATIONS FOR
UNIT 9

BLOWOUT RECOVERY

Modified Course Layout (Straight-line blowout)

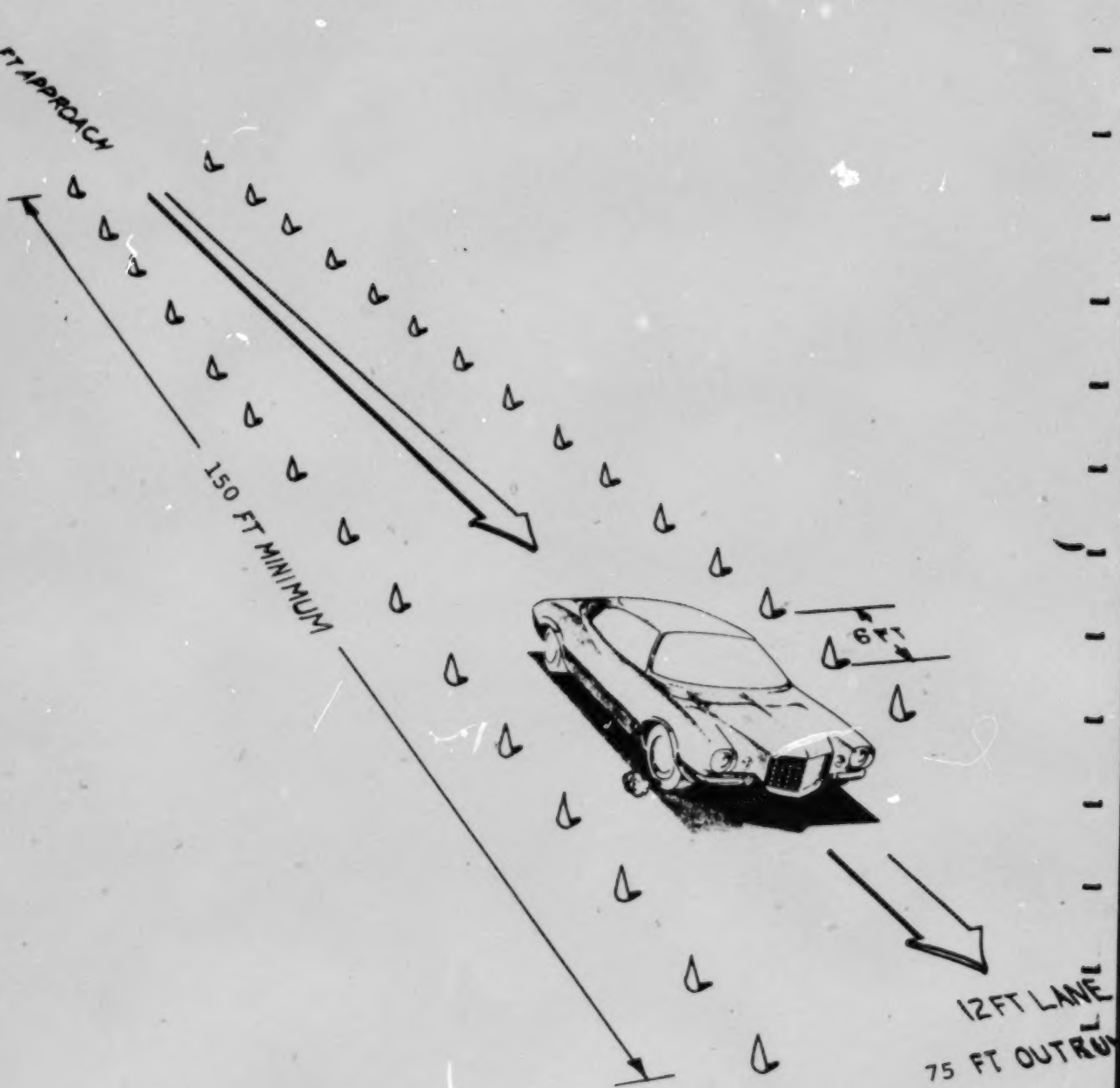
An approach lane 75 feet long leading to a 12 foot lane marked by cones on both sides, at least 150 feet in length. The cones should be placed about 6 feet apart. An outrun area of 75 feet is recommended. Maximum suggested speed is 25 mph.

Modified Course Layout (Blowout in a curve)

An approach lane 75 feet long leading to a 12 foot lane marked by cones set in a 175 foot radius. The cones should be spaced about 6 feet apart. The curve should be set in the opposite direction of the blowout unit. The speed should be kept at 25 mph on this type radius curve. An outrun area of 75 feet should be provided.

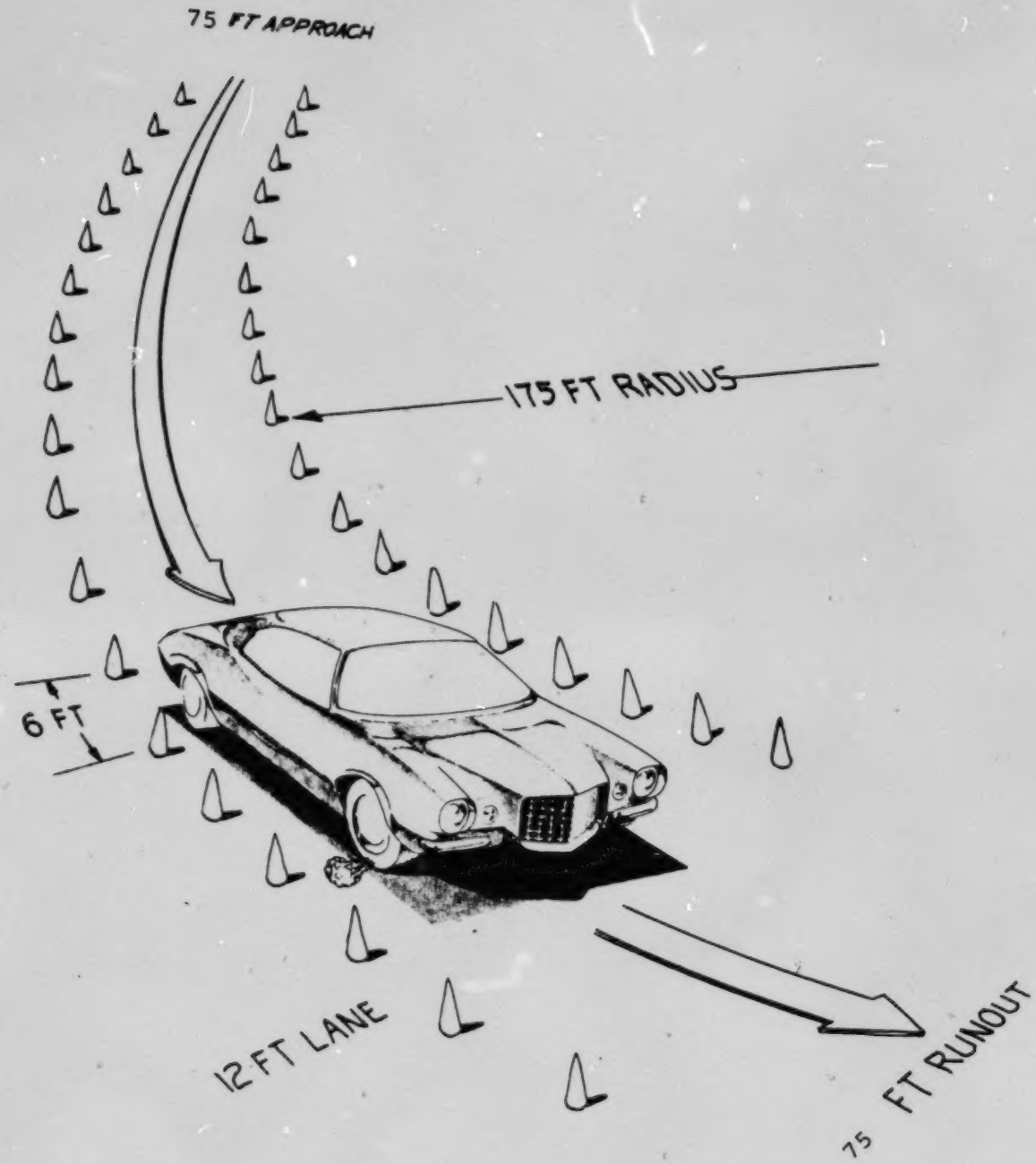
STRAIGHT LINE BLOWOUT

MODIFIED COURSE LAYOUT



BLOWOUT IN A CURVE

MODIFIED COURSE LAYOUT



MODIFICATIONS FOR
UNIT 9

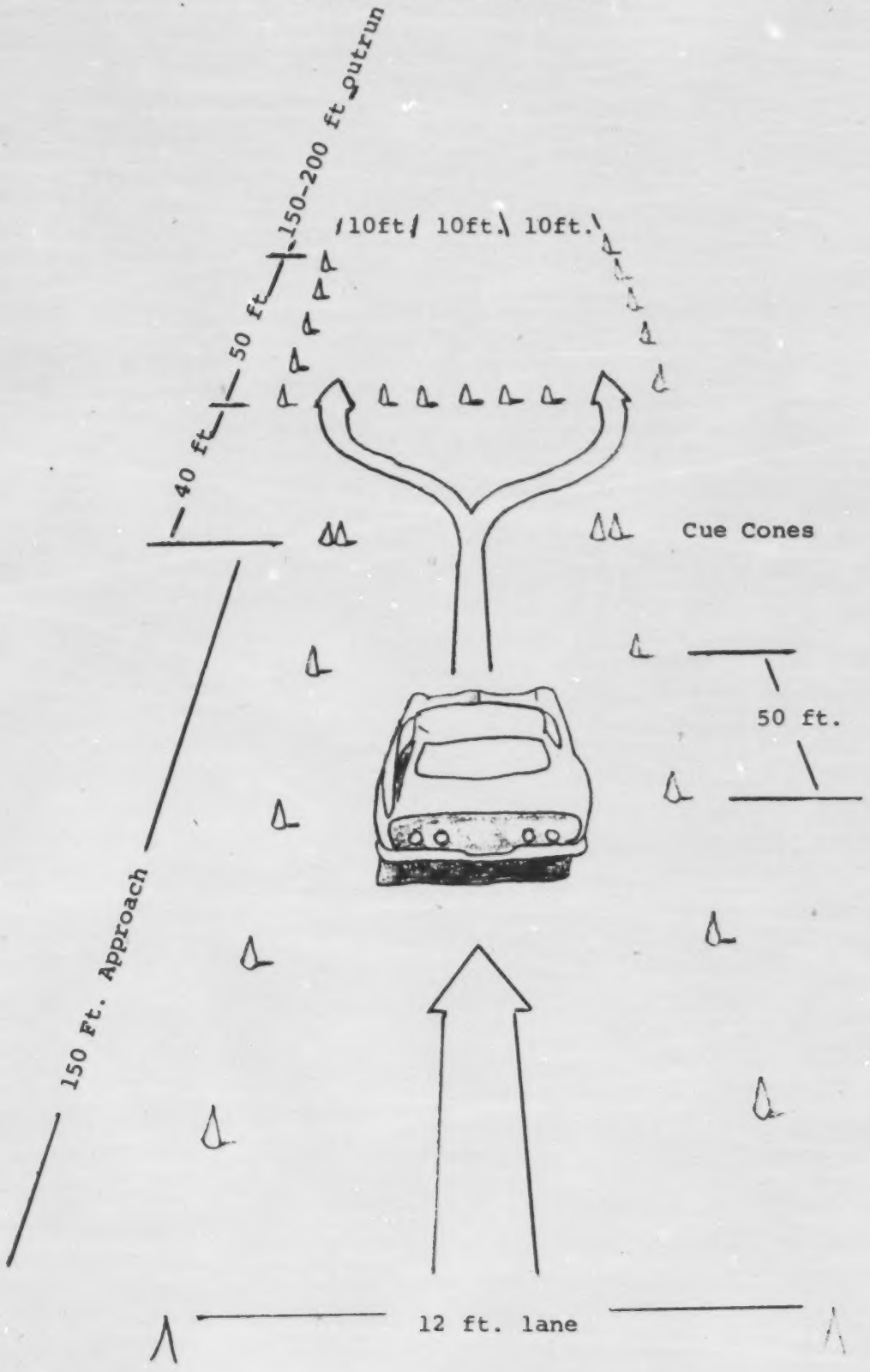
LEFT-RIGHT EVASIVE ON A WET SURFACE

Modified Course Layout

An approach lane 12 feet wide and 150 feet long leading toward a cone barrier. It should include a 10 feet wide run-out lane on either side of the barrier and extend for 50 feet. A double cue cone is set 40 feet from the barrier in the approach lane. This double cue cone serves as a cue point. Spacing between cones on the run out lane is 6 feet. The outrun area should be 150-200 feet long. Maximum speed should be 30 mph.

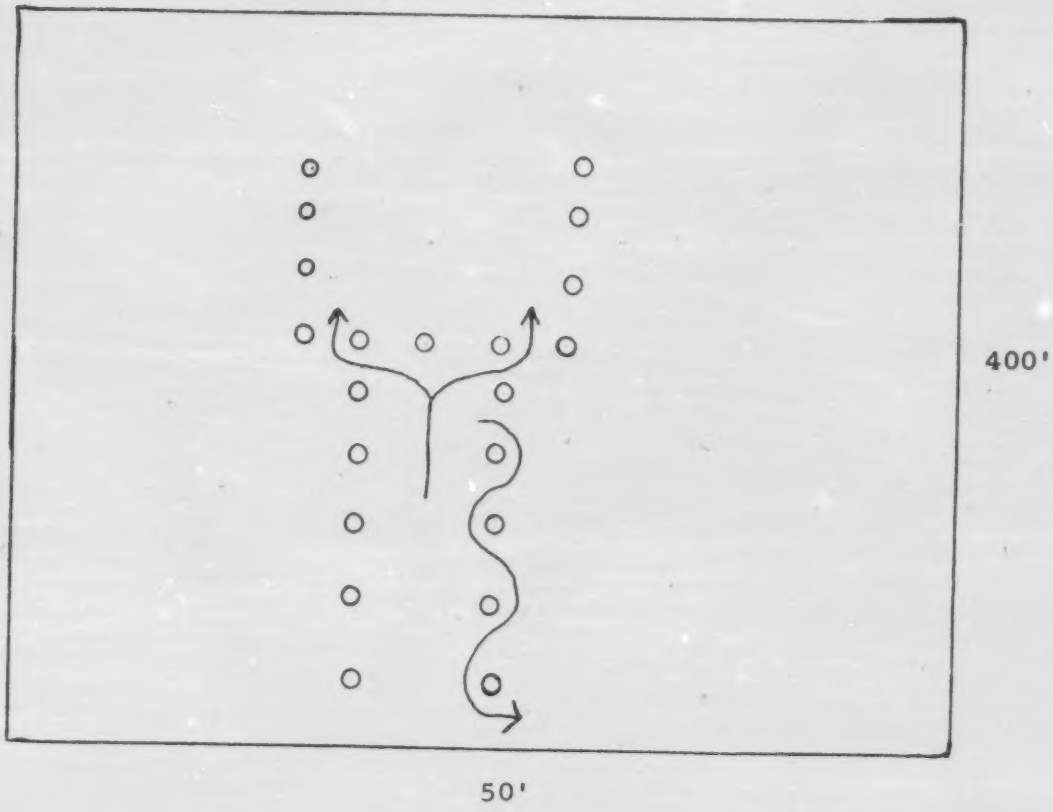
LEFT-RIGHT EVASIVE ON A WET SURFACE

MODIFIED COURSE LAYOUT

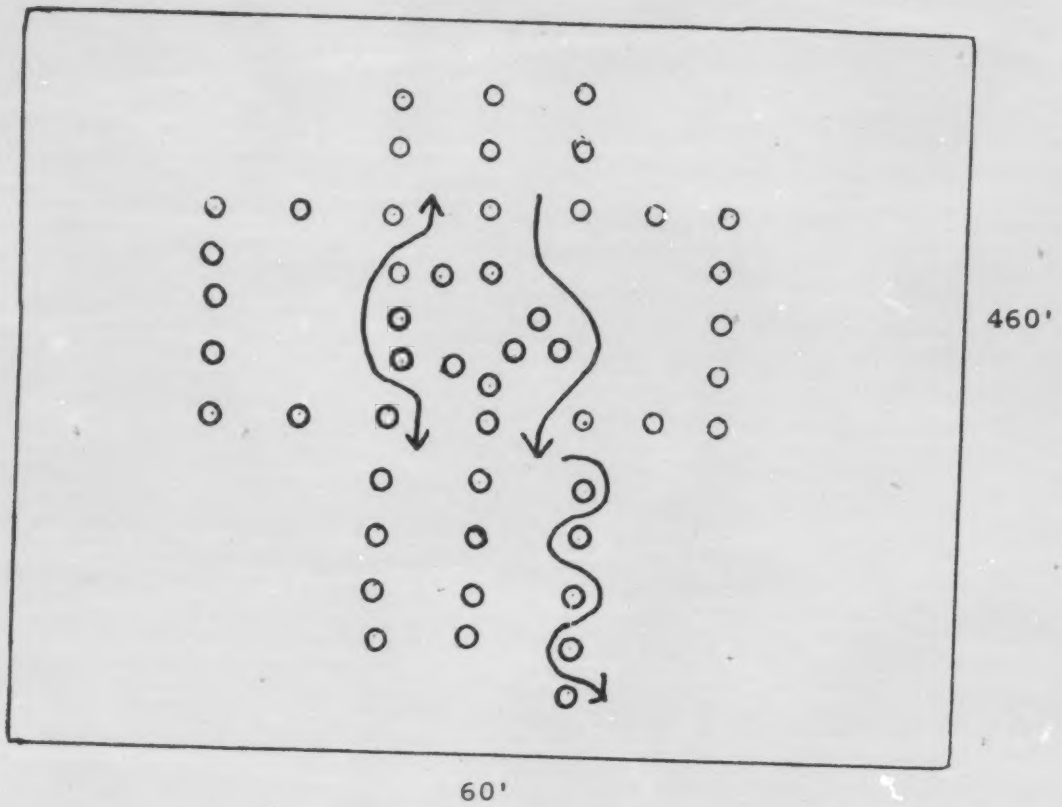


Often just changing the distance between cone placement will not be enough. Following are a few suggestions of modifying the maneuver in ways other than changing the standard cone placement.

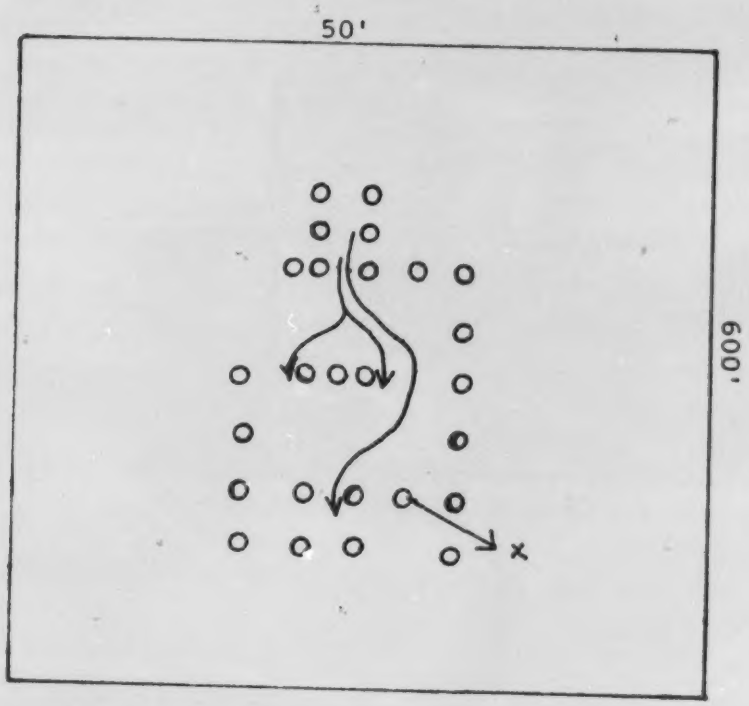
1. Serpentine and Left-Right Evasive Maneuver in the same setup.



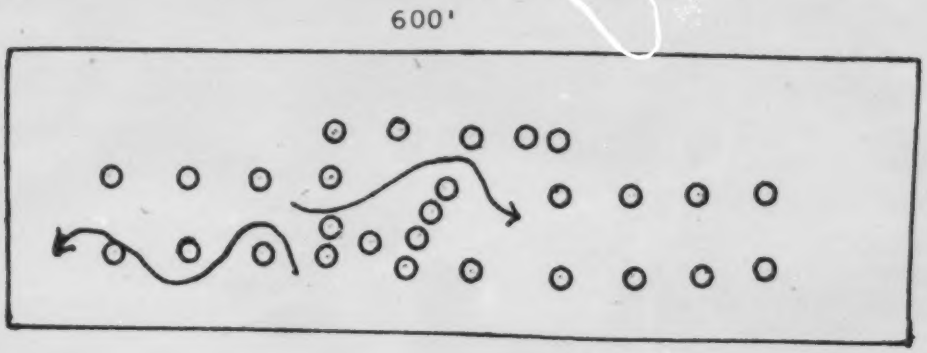
2. Controlled Braking, Off Set, and Serpentine maneuvers together.



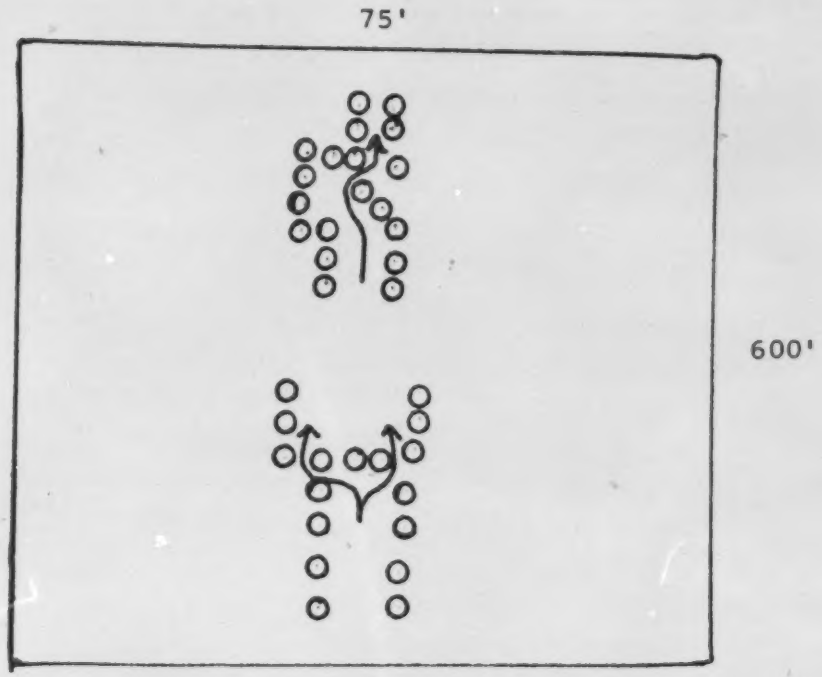
3. Controlled Braking and Left-Right Evasive by moving just one cone.



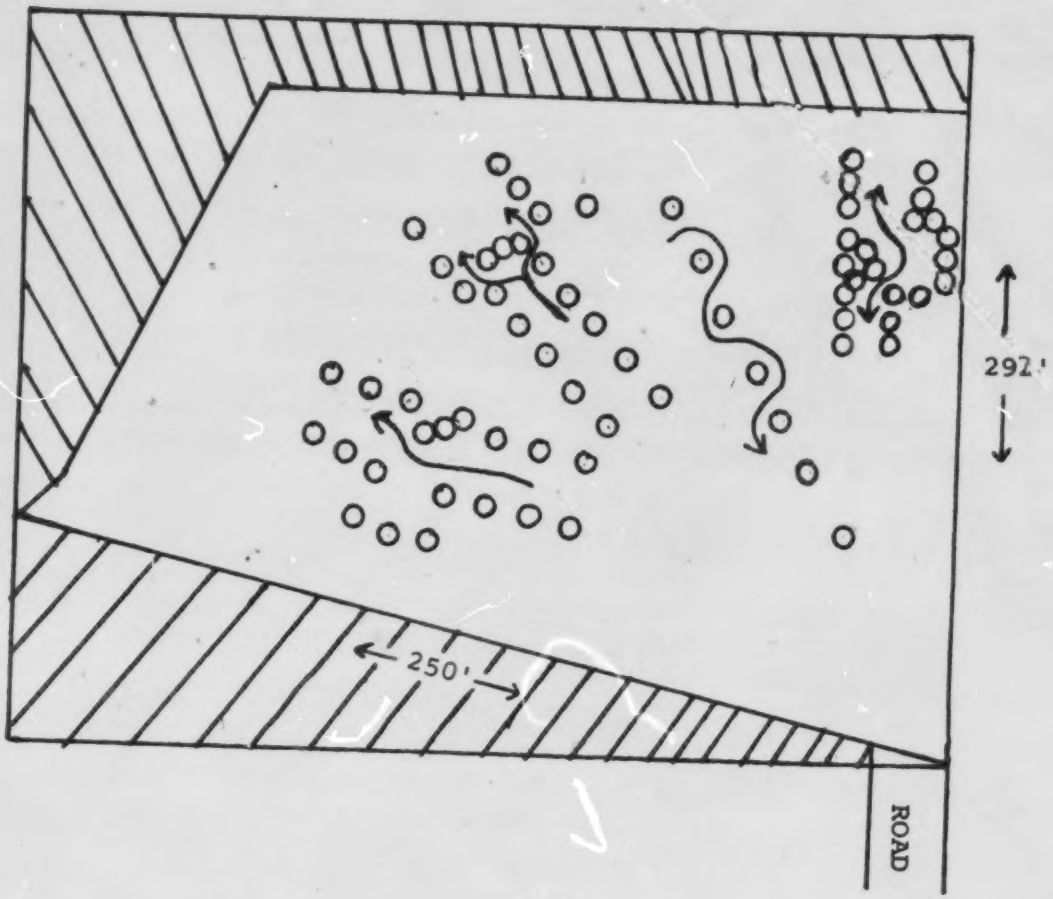
4. Serpentine and Controlled Braking.



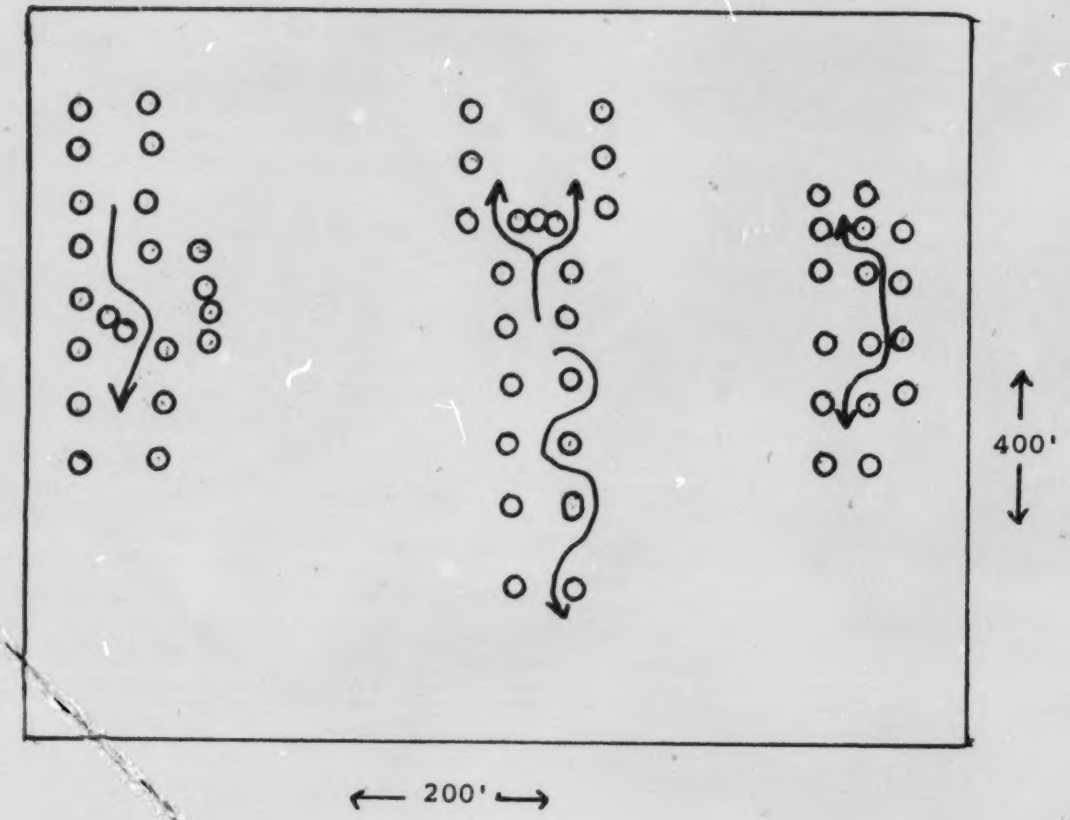
5. Left-Right and Controlled Braking.

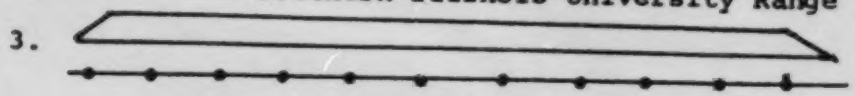


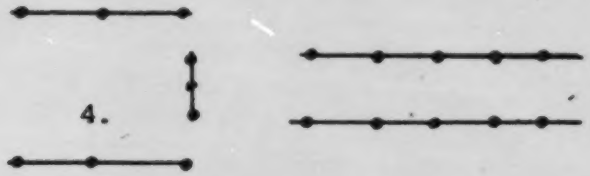
6. Modified Range Set-up.

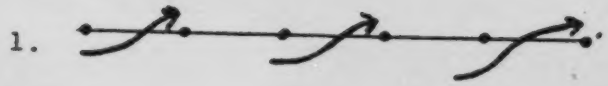


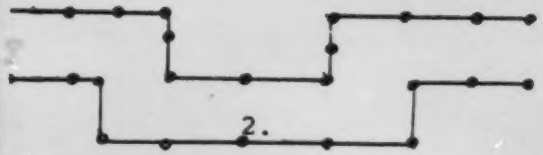
7. Modified Range Set-up.











1. Serpentine
2. Off-Set
3. Off-Road
4. Left-Right Evasive
5. Controlled Braking
6. Skid Control

APPENDIX A

Recommended Maximum and Minimum Distances of Maneuvers

Serpentine - Normal Size — Max. 28 mph.

Total distance-	500 ft.
6 cones @ 50 ft.-	250 ft.
Approach area-	175 ft.
Outrun-	175 ft.

Minimum Size — Max. 25 mph.

Total distance-	450 ft.
6 cones @ 45 ft.-	225 ft.
Approach area-	75 ft.
Outrun-	100 ft.

Off-set - Normal Size — Speed is not important

Total distance-	152 ft.
Approach area-	32 ft.
Left lane change area-	24 ft.
Left lane-	40 ft.
Right lane change area-	24 ft.
Outrun-	32 ft.

Minimum Size

Total distance-	110 ft.
Approach area-	16 ft.
Left lane change area-	24 ft.
Left lane-	30 ft.
Right lane change area-	24 ft.
Outrun-	16 ft.

Evasive - Normal Size — Max. 40 mph.

Total distance-	600 ft.
Approach-	250 ft.
Cue to barrier-	50 ft.
Left/right evasive area-	50 ft.
Outrun-	250 ft.
Barricade width-	12 ft.
Evasive width R/L-	12 ft. each

Minimum Size
Total distance- 440 ft.
Approach area- 150 ft.
Cue to barricade- 40 ft.
Left/right
evasive area- 50 ft.
Outrun- 200 ft.

Controlled Braking - Normal Size Max. 40 mph.
Total distance- 460 ft.
Approach area- 200 ft.
Cue to Barricade- 50 ft.
Barricade to right
lane- 60 ft.
Outrun- 150 ft.

Recommended 25 mph.
Total distance- 340 ft.
Approach- 150 ft.
Cue to barricade- 40 ft.
Barricade to right
lane- 50 ft.
Outrun- 100 ft.

* Minimum Size Max. 20 mph.
Total distance 300 ft.
Approach- 150 ft.
Cue to barricade- 30 ft.
Barricade to right
lane- 40 ft.
Outrun- 80 ft.

Width for lanes are 12 ft.

* There is a problem area with power steering lockout in controlled braking using 300 ft. distance maneuver.

Also the speeds will vary from vehicle to vehicle.

APPENDIX B

VISUAL AIDS

AEtna Life & Casualty Company. "Don't Skid Yourself."

California Highway Patrol. "Emergency Vehicle Operations Course." Charles Cahill and Associates, Inc.

California Highway Patrol. "Routine Stop." Charles Cahill and Associates, Inc.

Film Loops, Inc. Emergency Driving Procedures (General Motors).

Ford Motor Company. "Controlling Skids."

Ford Motor Company. "Critical Maneuvers--Skids."

Ford Motor Company. "Seeing Eye Habits for Expert Driving."

Ford Motor Company. "Wheels off Pavement."

Ford Motor Company. "Your Car in Motion."

International Association of Chiefs of Police. "Safe Driving Techniques." Sight/Sound Training Filmstrip # 12.

Liberty Mutual Insurance Company. "Six Deadly Skids"

Maryland Police Training Commission. "Emergency Driving Skills-Laboratory Exercises."

Modern Talking Pictures Service, Inc. "Skid Control."

National Safety Council, Safe Winter Driving League. "Winter Traction . . . and the Lack of It."

State of Maryland, Driver and Safety Transportation Section. The IPDE System."

SIMULATION FILMS

AEtna Life & Casualty Company. "Crash Avoidance."

AEtna Life & Casualty Company. "Good Driving in Bad Weather."

AEtna Life & Casualty Company. "Perceptive Driving."

AEtna Life & Casualty Company. "Winterproof Your Driving."

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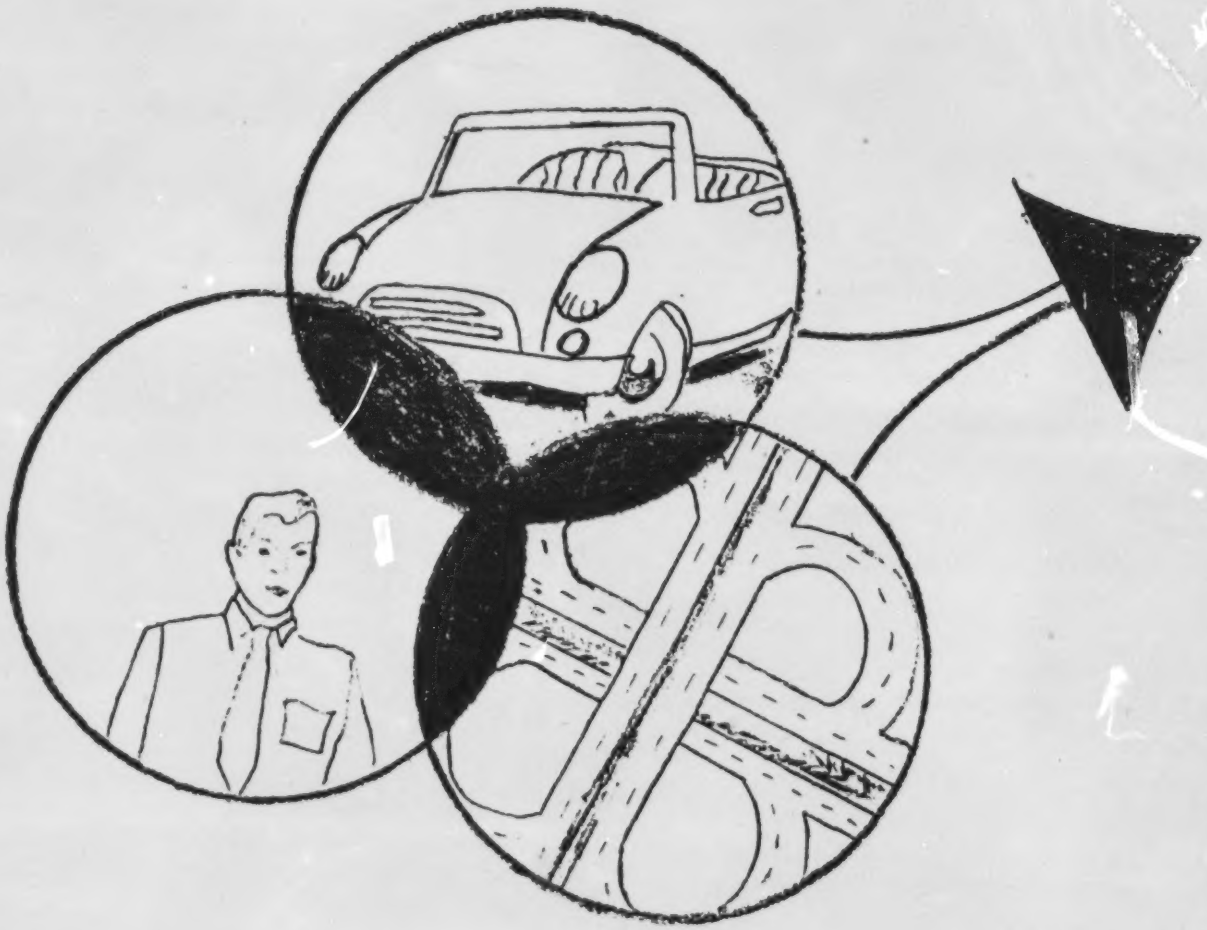
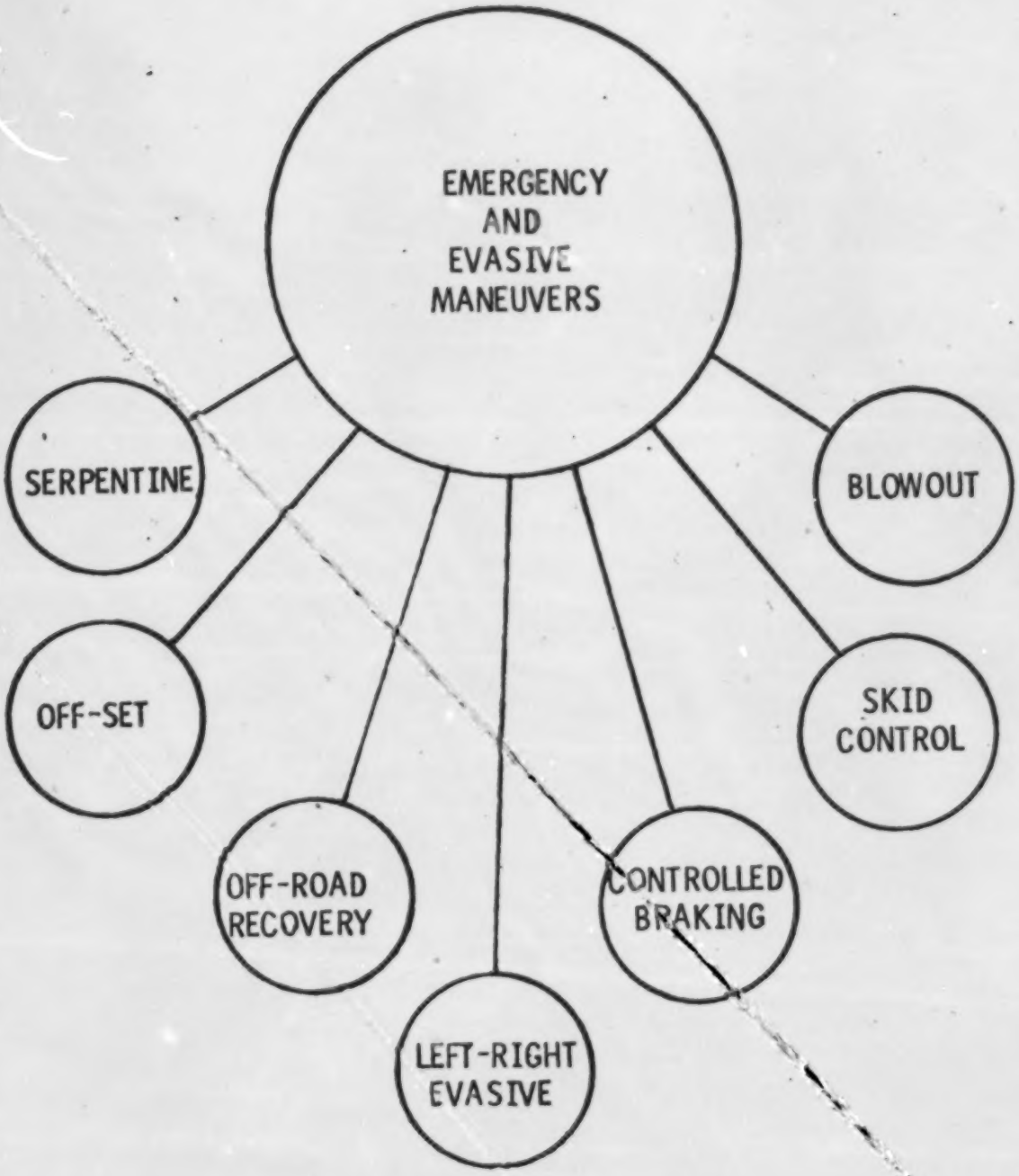
APPENDIX C



The Driving Task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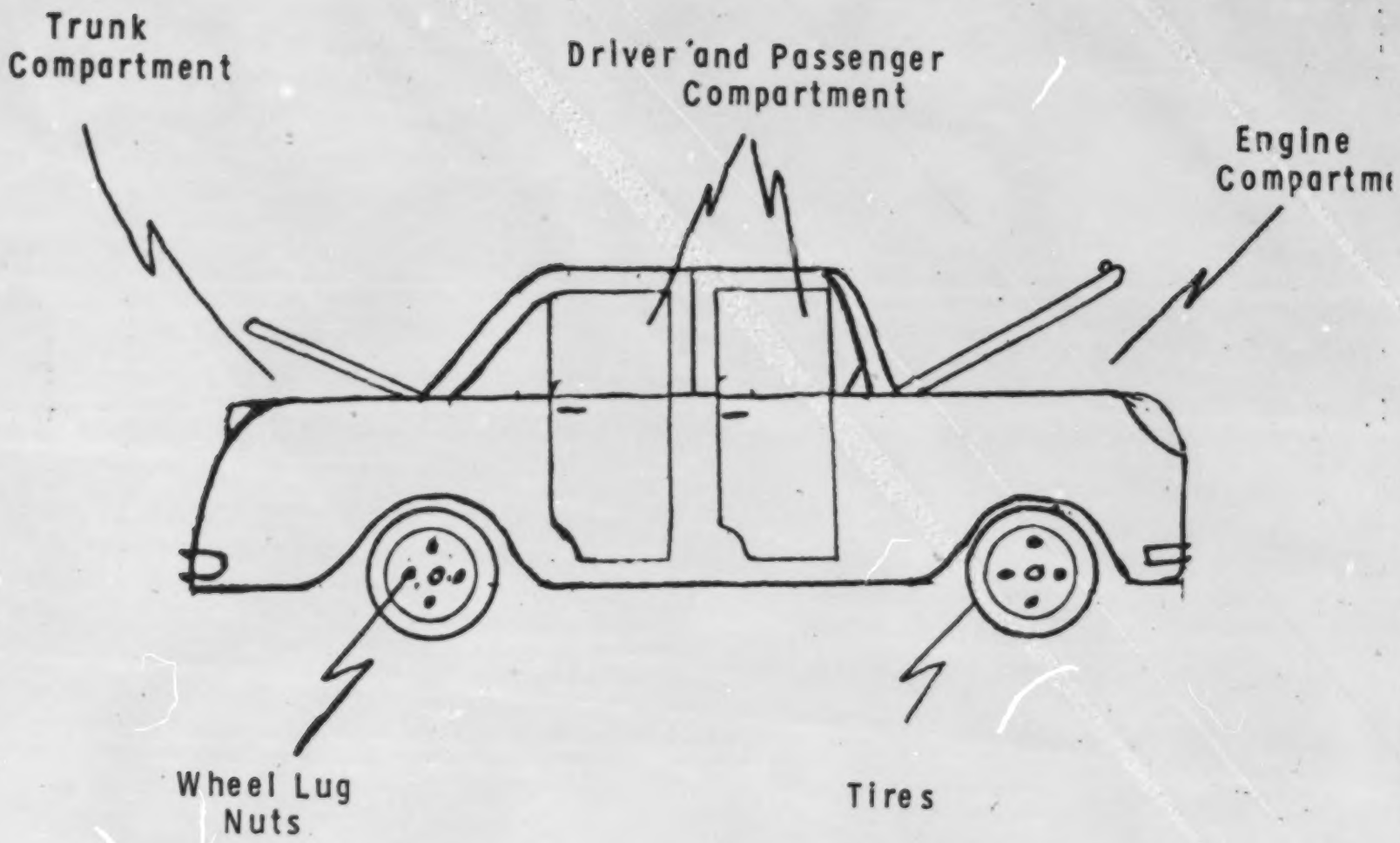
CONTROL
BLOWOUT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Driver and Passenger
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146

SEARCH

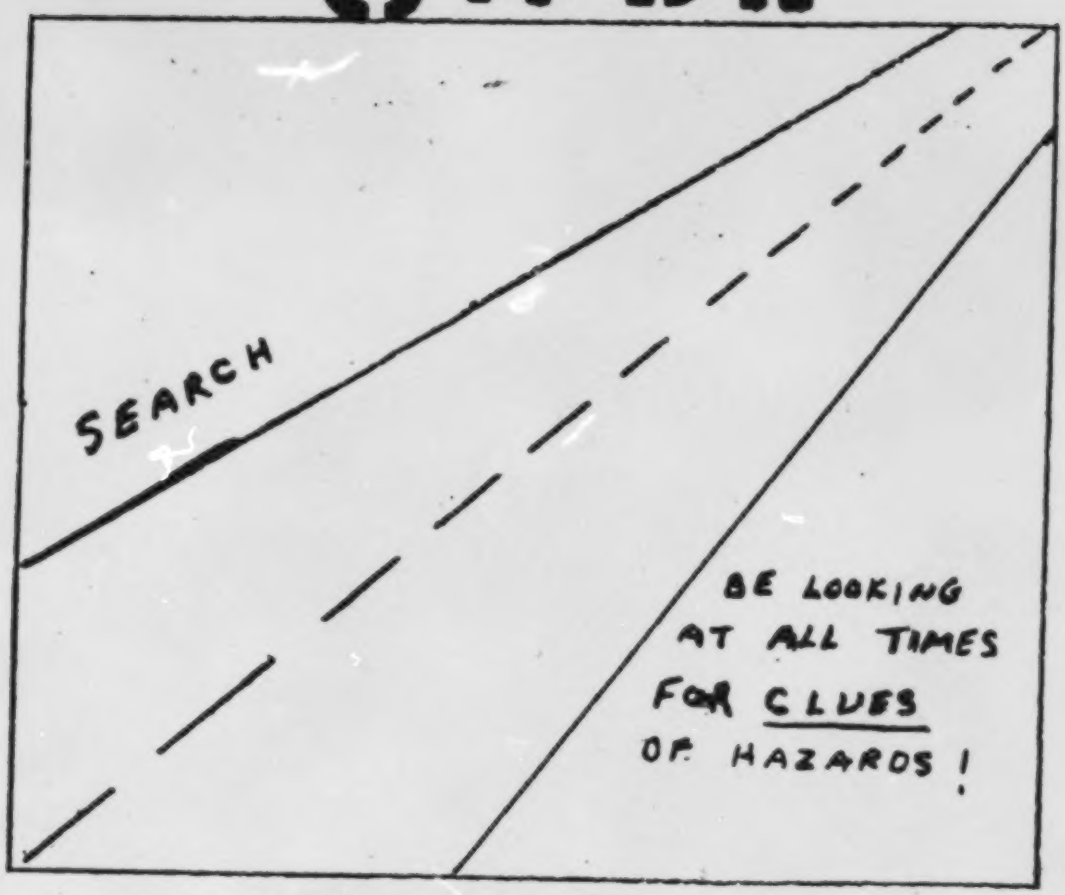
IDENTIFY

PREDICT

DECIDE

EXECUTE

SIPDE



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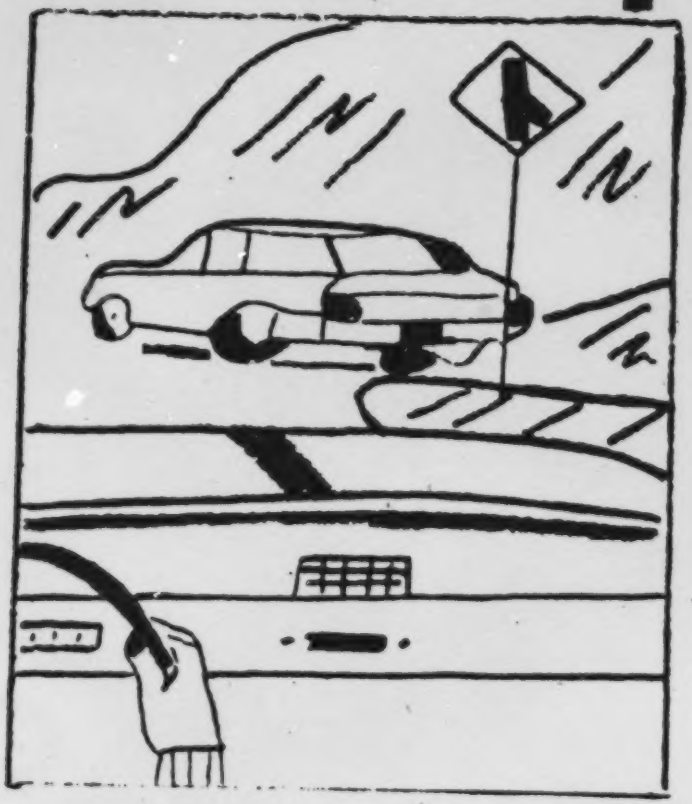

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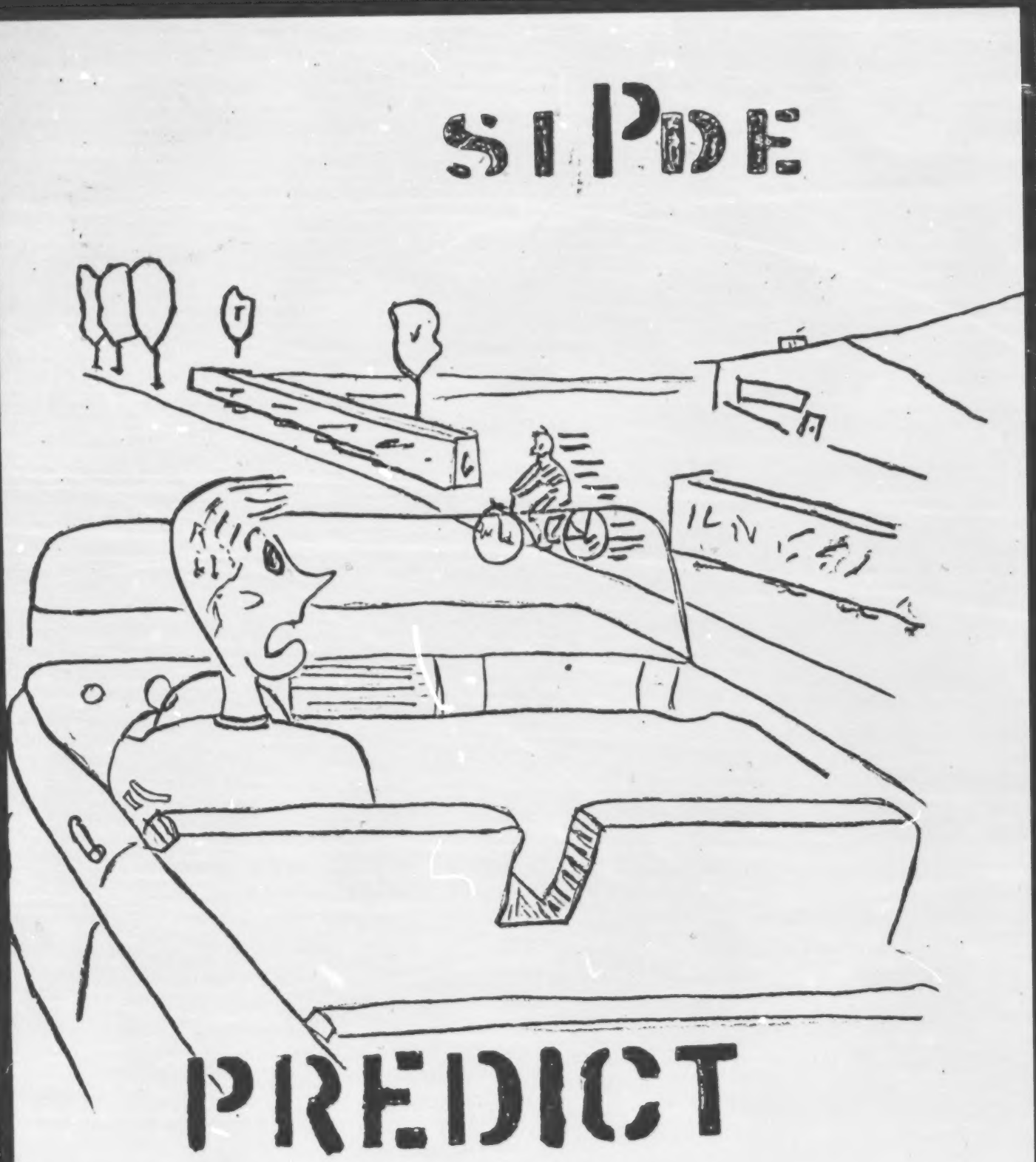
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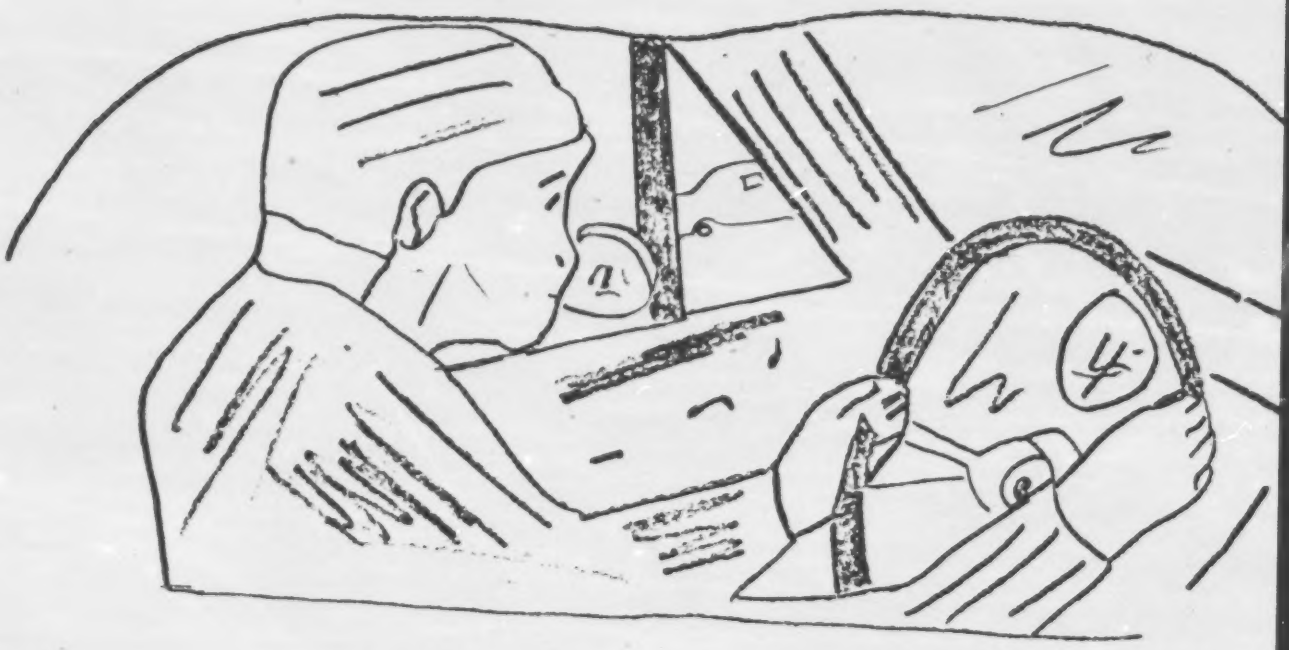


DECIDE

152

SIPD E

SPEED UP

PASS

EVADE

EXECUTE

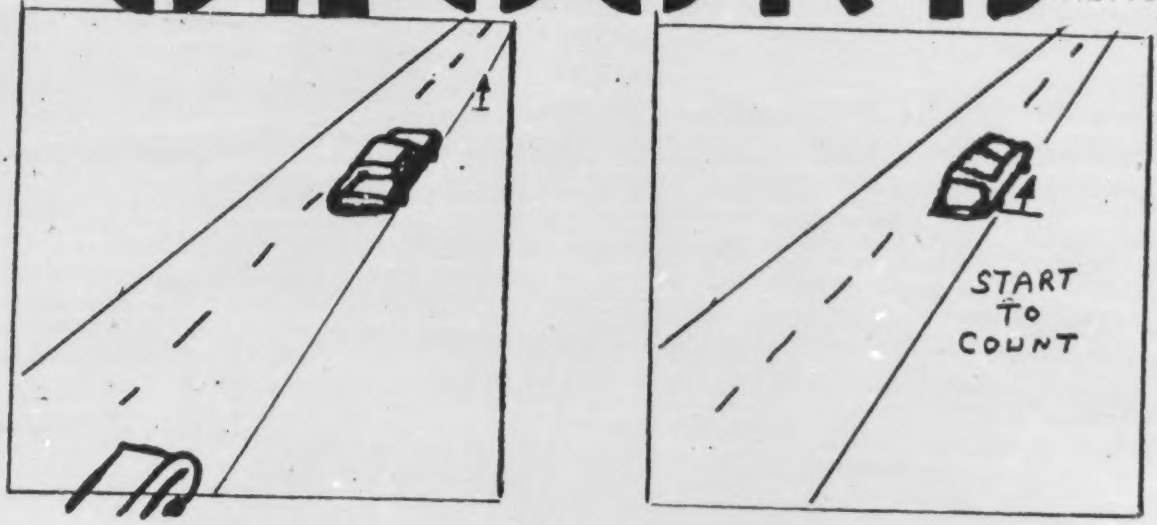
SLOW DOWN

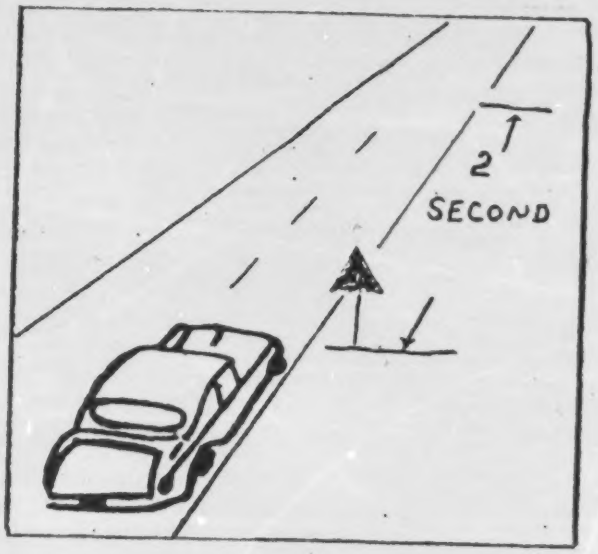
RIGHT ↘ TURNS

LEFT ↘

153

2 SECOND





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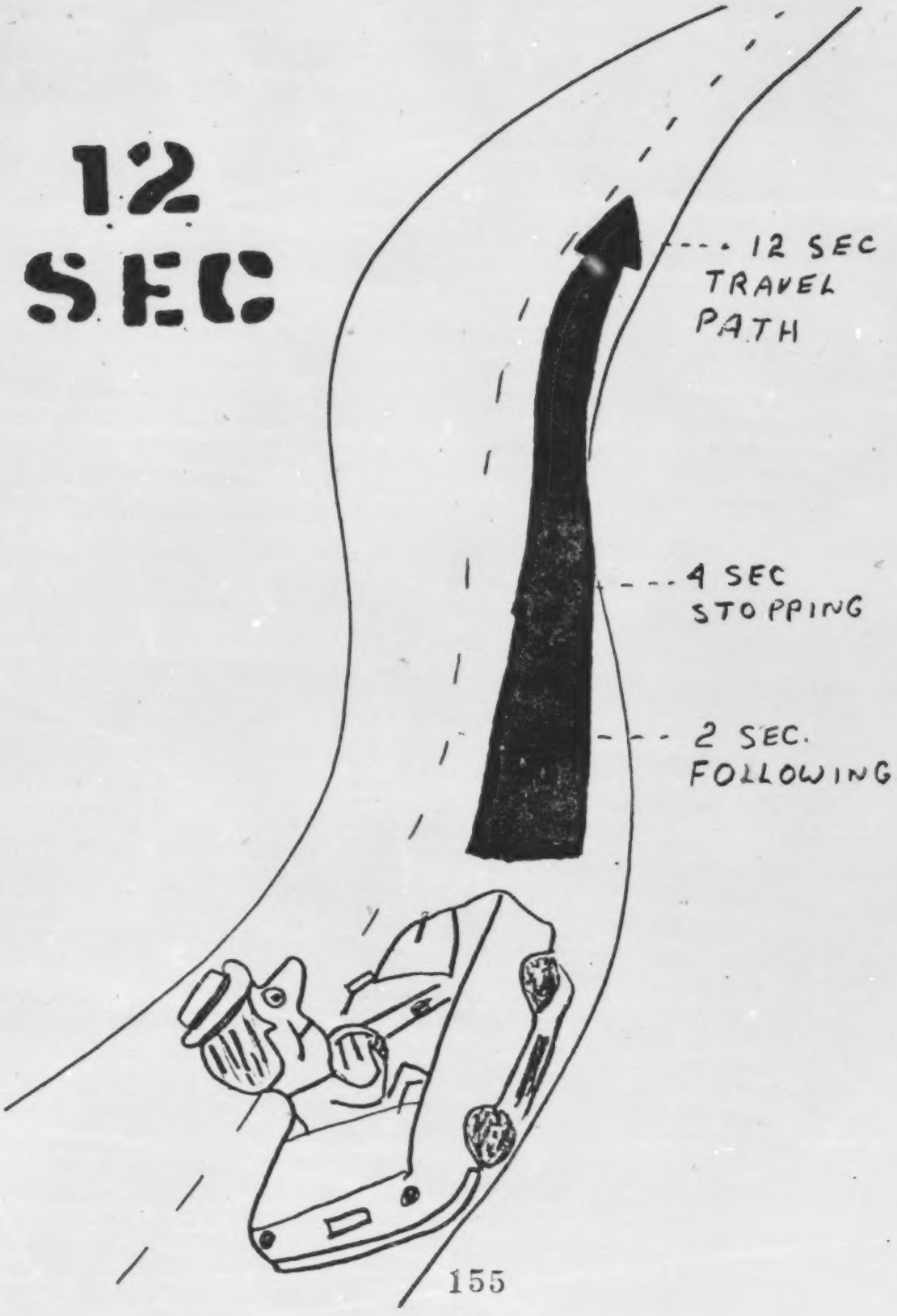

SCAN

FAR

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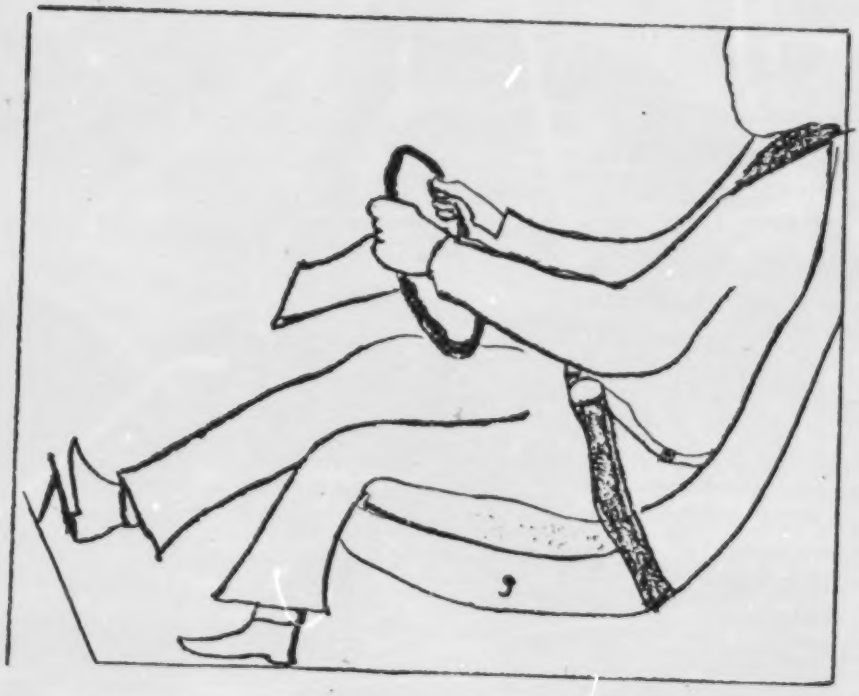
157

Unit 2

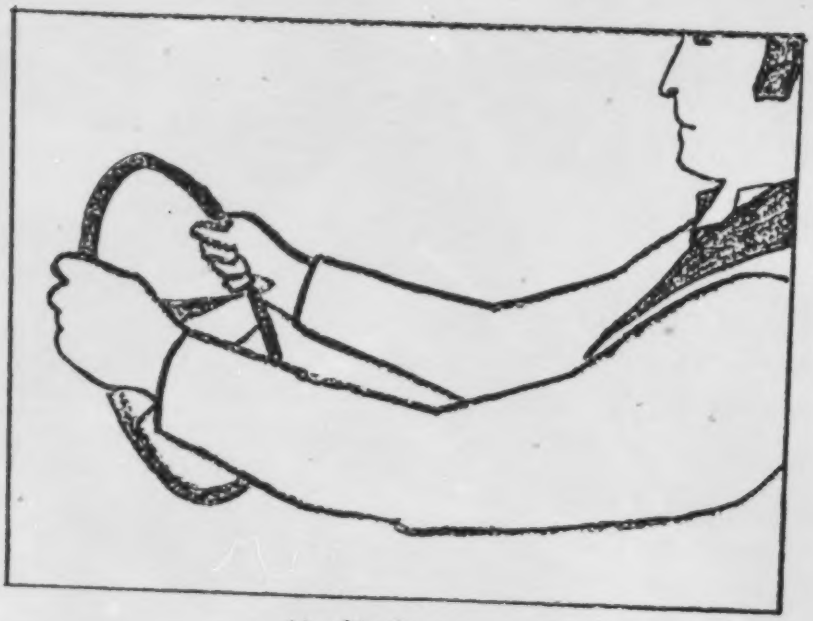
Proper Seat Adjustment

As far back as your leg length allows and still be able to reach controls.



Unit 2

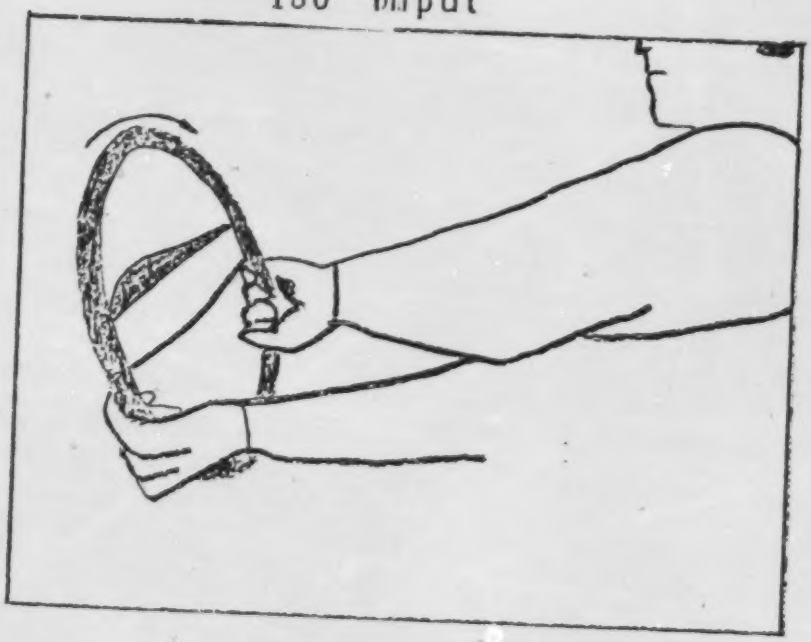
Proper Adjustment of Mirrors



Unit 2

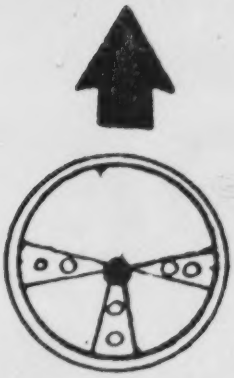
9-3 Steering

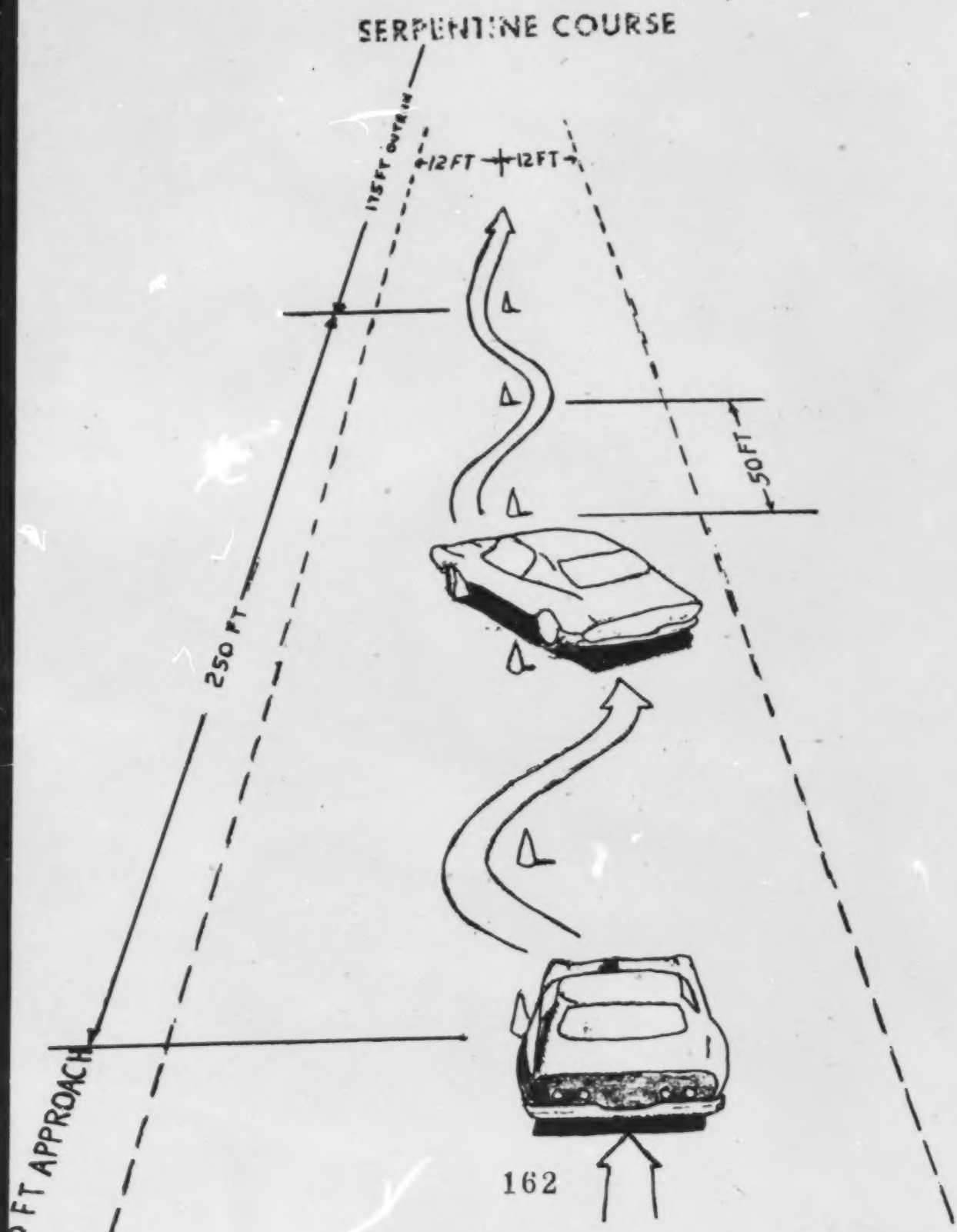
180^{0} input



Unit 2

Always take out the same amount of steering that has been put in.




SERPENTINE COURSE
175FT OUTER LIM
12FT
12FT
50FT
250 FT
175 FT APPROACH
162

Proper Procedure
for Serpentine
Unit 3

4. Student will drive through the course maintaining good perception, speed and rhythm.
3. Approach the first cone in a straight line as close as possible.
2. The speed will be selected by instructor.
1. Proper 9 - 3 hand position.

Unit 3

Problem Areas in Serpentine

Steers too much - car swings out wide and misses rest of cone.

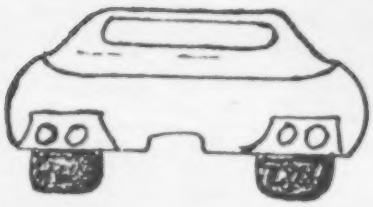
Steering recovery is too slow.

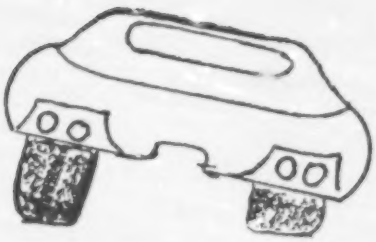
Moves hand on steering wheel - loses reference point (9-3).

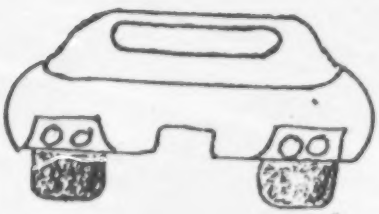
Steering input too early also vision too low.

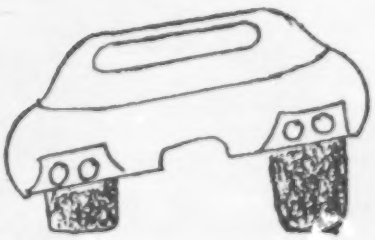
Too wide on first cone.

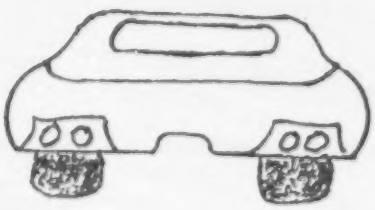
Car Lean



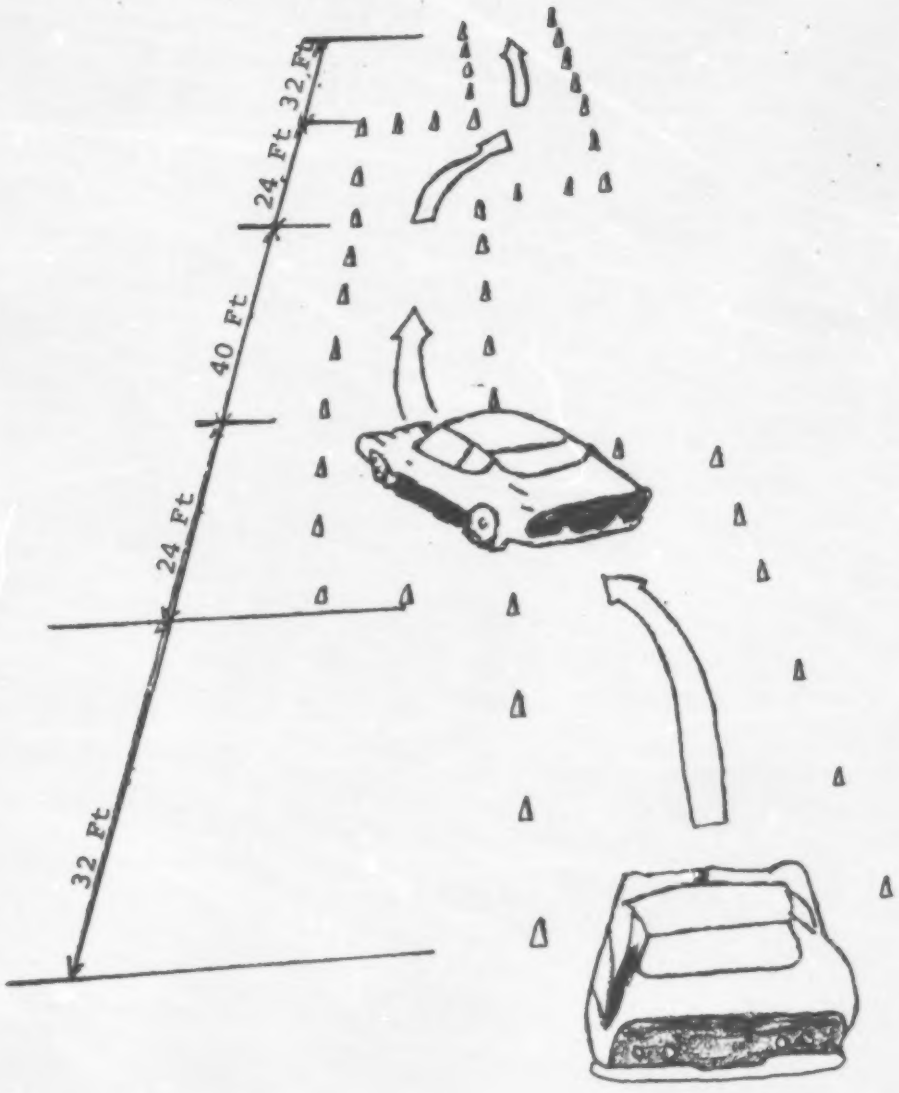








OFF-SET LANE



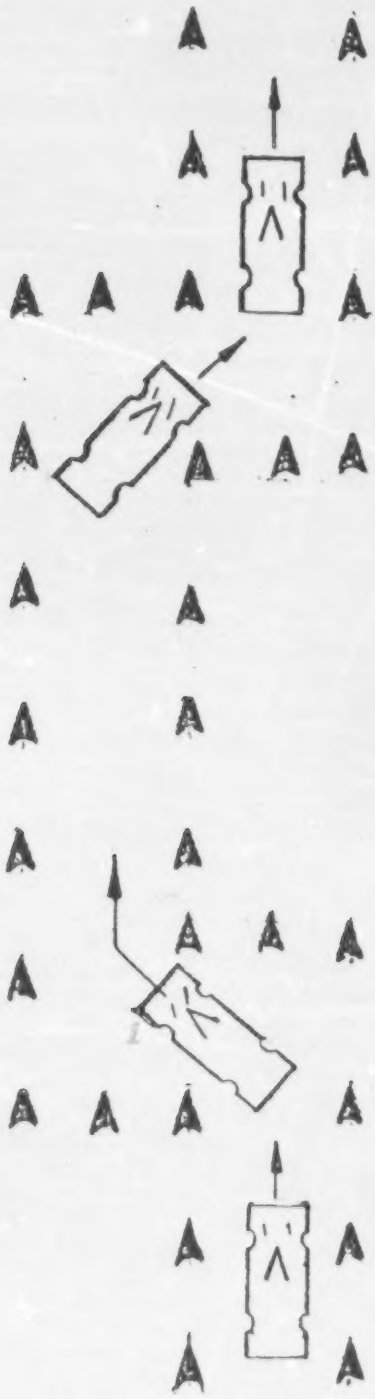
APPROACH

Unit 4

Off-Set
Forward

Procedure

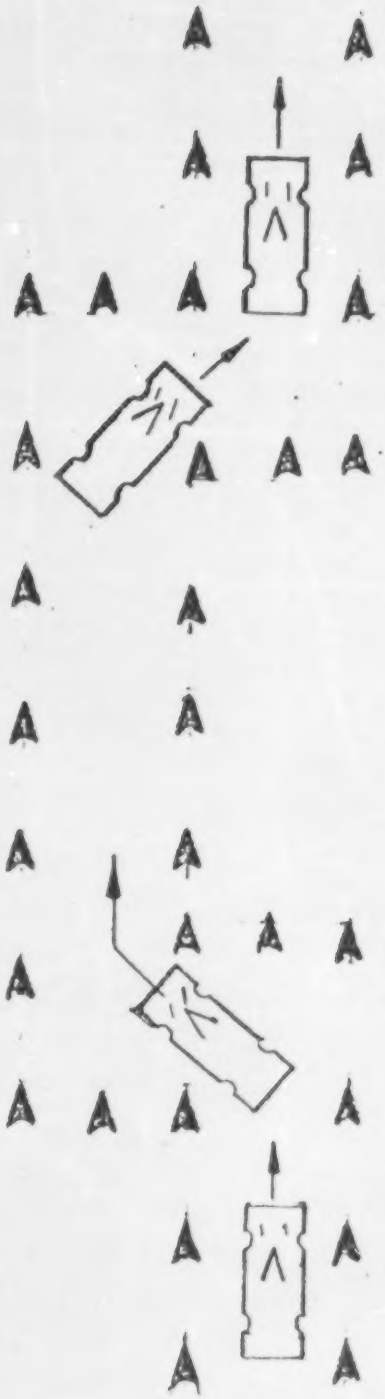
5. Straighten car and then stop.
4. Steers approximately 180° back to the right.
3. Steers approximately 180° to the left.
2. Look for anticipated path of travel
1. Proper 9 - 3 hand position.



Unit 4

Problem Areas

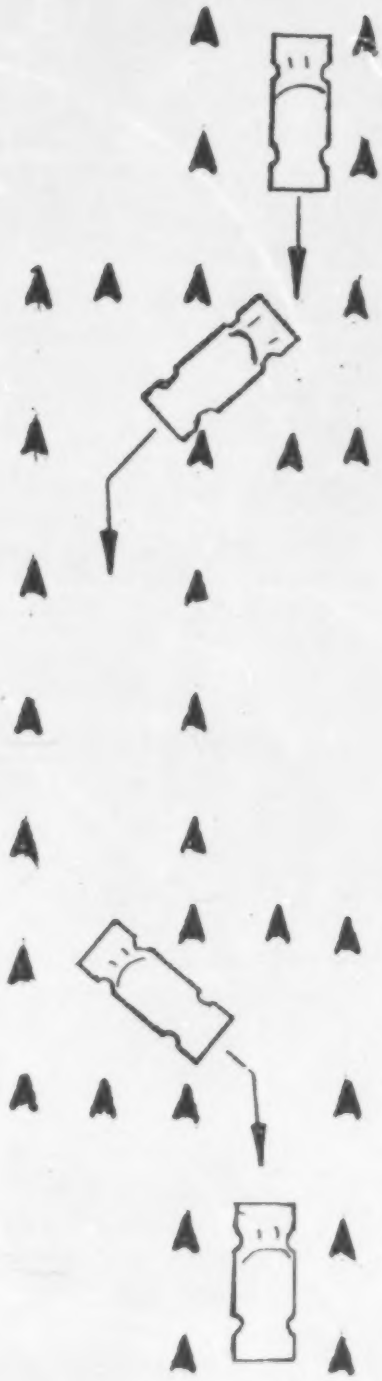
4. The speed too fast for maneuver.
3. Understeer and/or under-corrects.
2. Oversteers and/or over-corrects.
1. Vision aimed too low.



Unit 4

Off-set
Backward

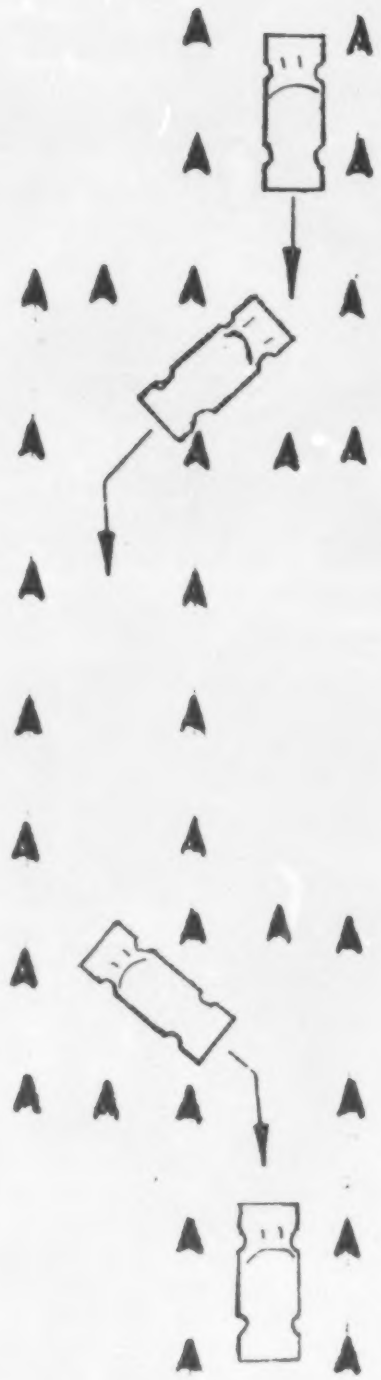
5. Straightens car and stops.
4. Steers approximately 110° back to the right.
3. Steers approximately 110° to the left.
2. Look for anticipated path of travel.
1. Proper driving position - big picture through the rear window.

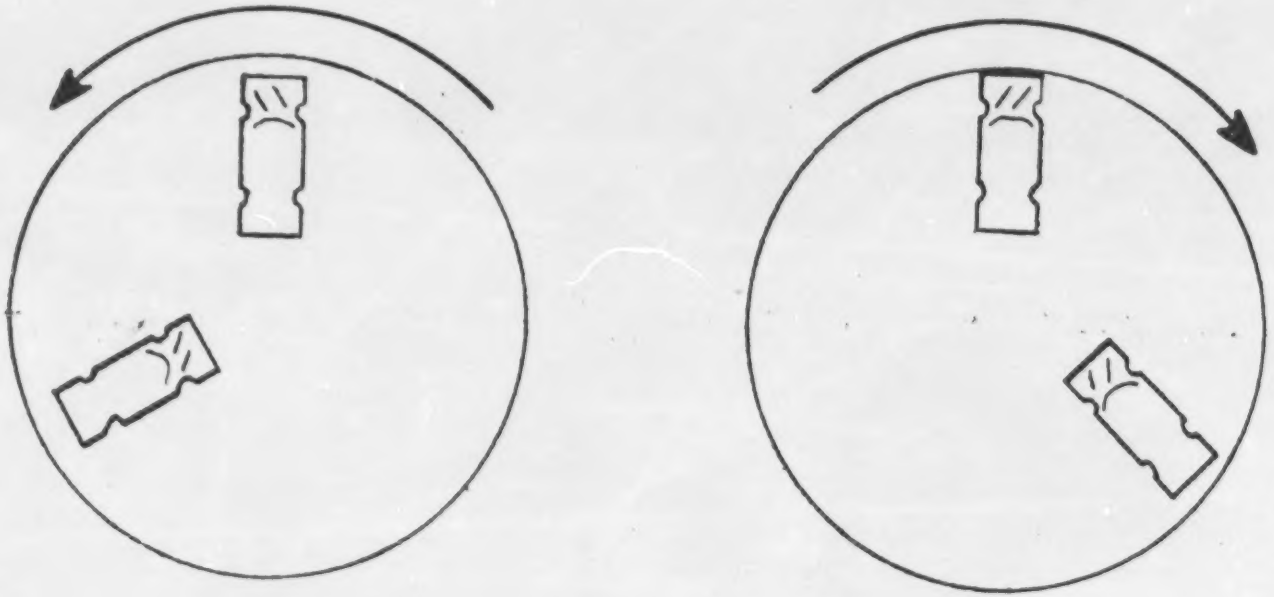


Unit 4

Problem Areas

5. Turn wrong way - does not realize the vehicles direction.
4. The speed too fast.
3. Understeers and/or under-corrects.
2. Oversteers and/or overcorrects.
1. Bad vision - too low and too small of picture.





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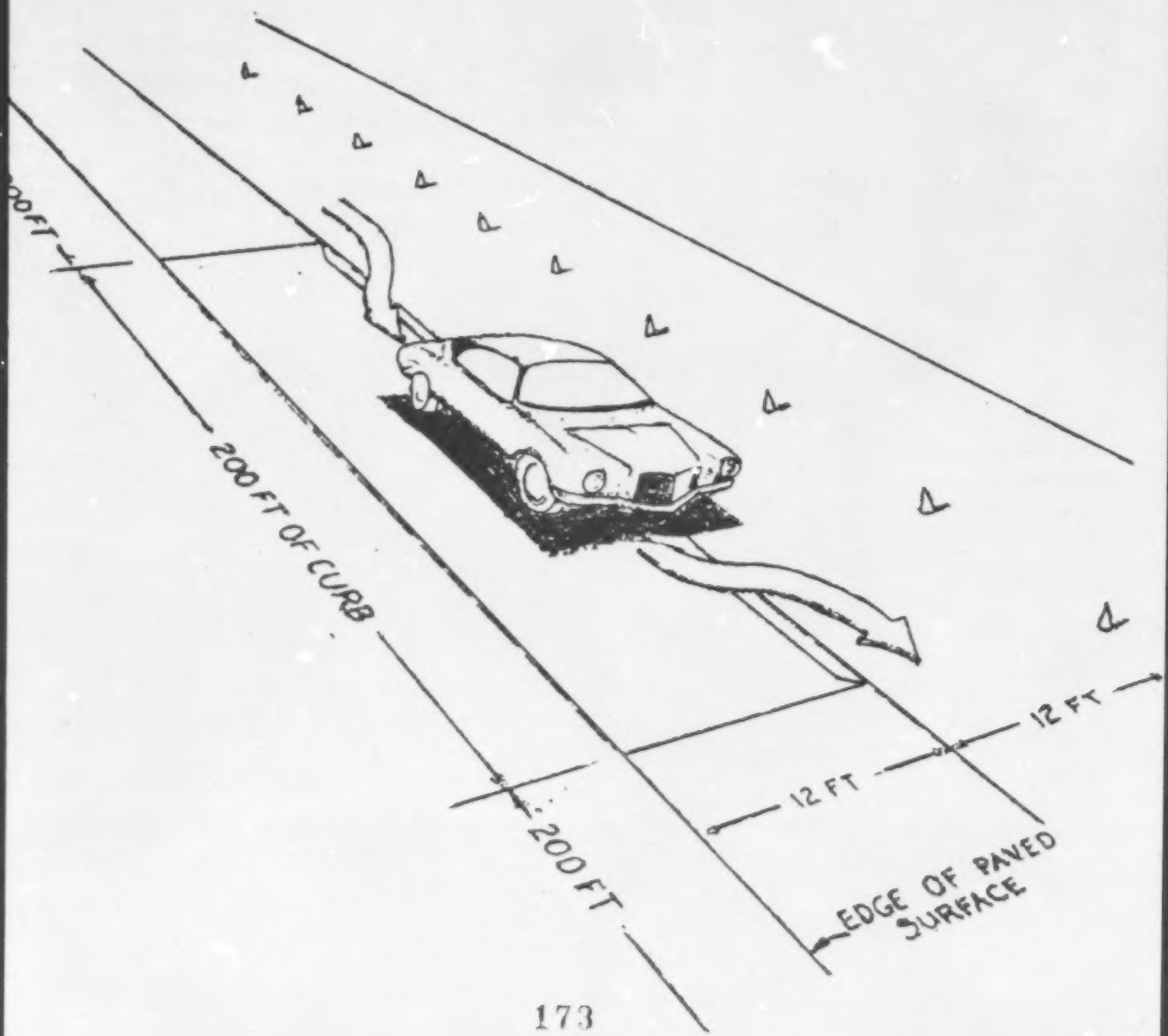
Unit 4

Steering Backward

Turn the steering wheel in the direction you wish the rear of the car to go.

OFF-ROAD RECOVERY



Unit 5

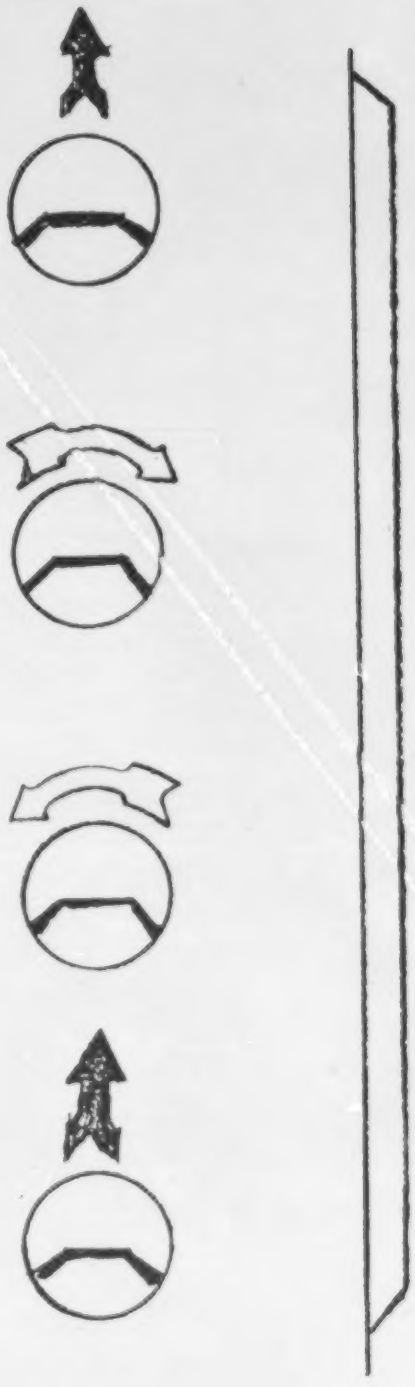
Steering Procedures

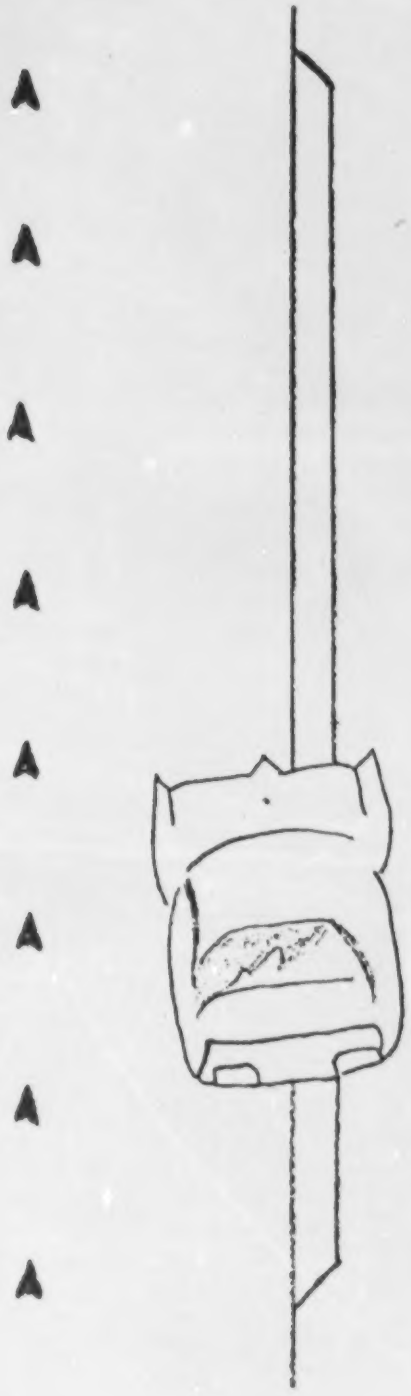
4. Steer left 90° to maintain a good straight lane position.

3. Start steering recovery of approximately 180° to the right when the front right tire tcuches curb.

2. Turn the steering wheel approximately 90° to the left.

1. Position the vehicle half off the road.





Unit 5

The Main Problem Area in Off-Road Recovery

Not centering the vehicle with curbing.

Causing tires to scrub or hook curb.

Unit 5

Problems in Off-Road

Panics and hits the brakes.

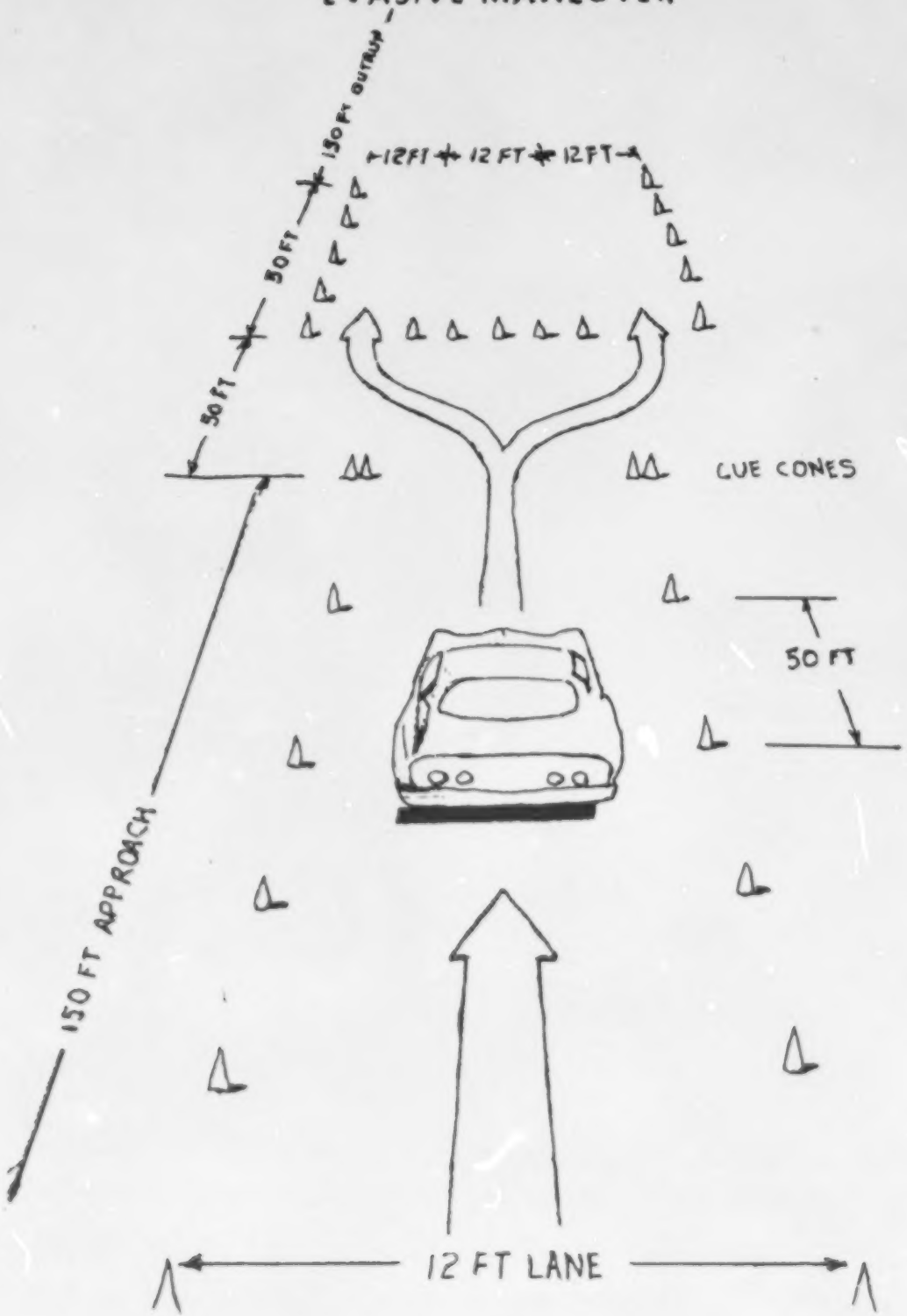
Anticipates recovery steer before front tire hits curb.

Steering recovery is greater than input - causes vehicle to drop back off road.

Steering recovery too slow causes vehicle to leave its lane.

Steering input too slow causing the tires to scrub.

EVASIVE MANEUVER



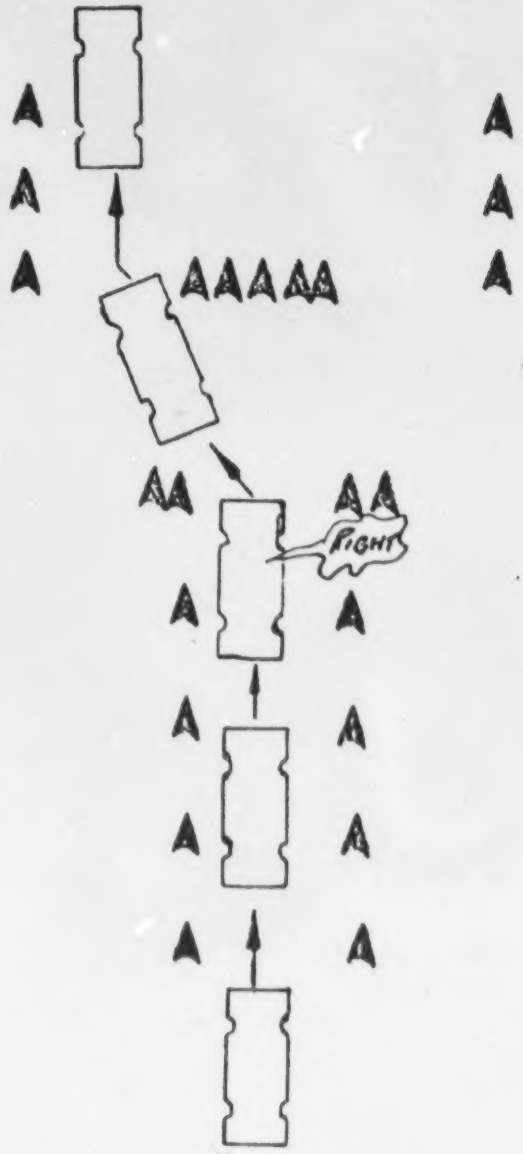
Unit 6

Procedure for Evasive Maneuver

4. Steer in direction of command and then counter-steer for proper lane position.
3. Command of Right or Left at cue cones.
2. Speed determined by instructor.

9-3

1. Proper hand position.



Unit 6

Problem Areas of
Evasive Maneuver

-Steers and countersteers late

-Oversteers

-Accelerates

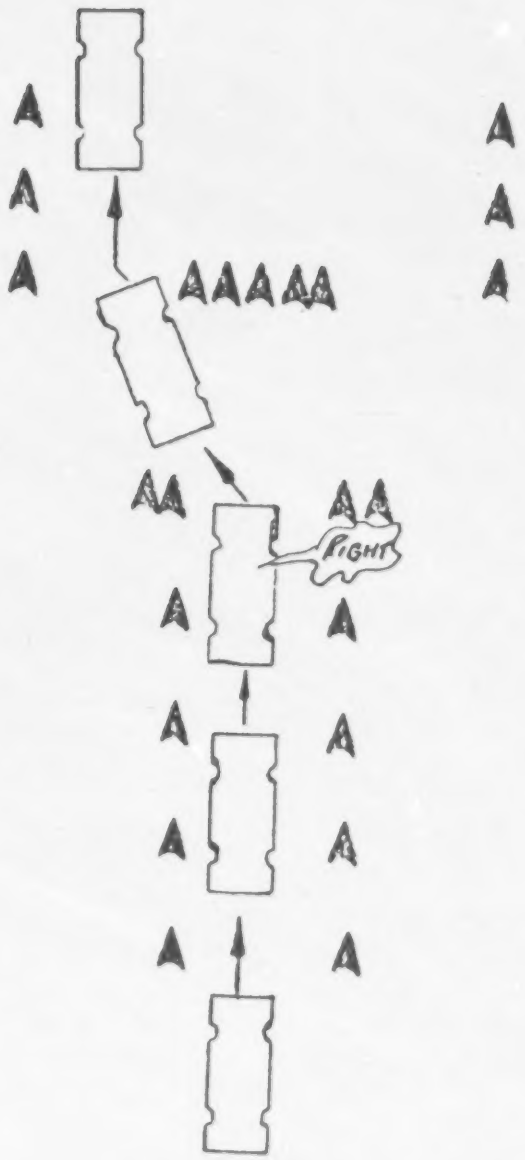
-Fights steering wheel

-Panic brakes

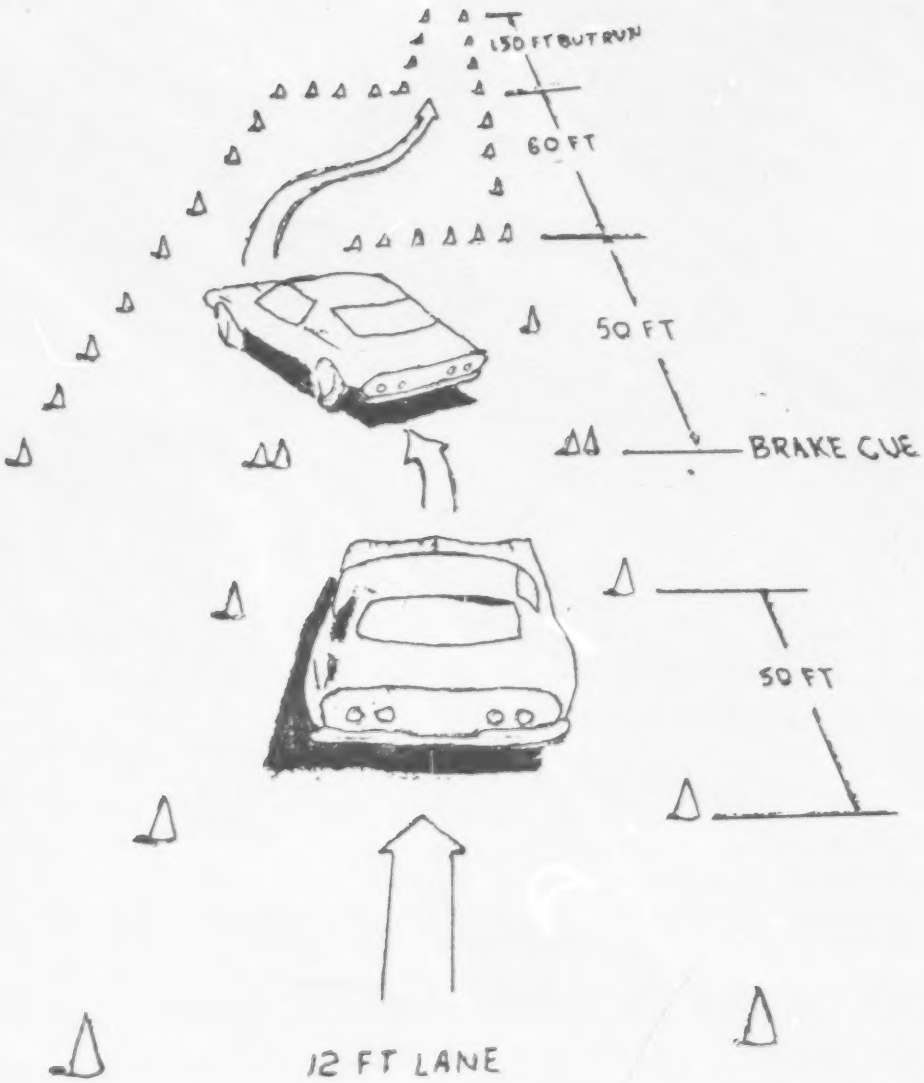
-Starts to steer one direction, then decides to steer the other way

-Turns wrong way - usually because of anticipation

-The vision is aimed too low.



CONTROLLED BRAKING



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Unit 7

Procedures for Controlled Braking

6. Stop at end of cone lane.
5. Steer back into proper lane as quickly as possible maintaining control.
4. Steer around barricade without locking brakes and losing steering.
3. Braking command will be given at cue cones.
2. Speed determined by instructor.
1. Proper 9-3 hand position.

Unit 7

Problem Areas in Controlled Braking

Steers too much and too fast - loses control of vehicle

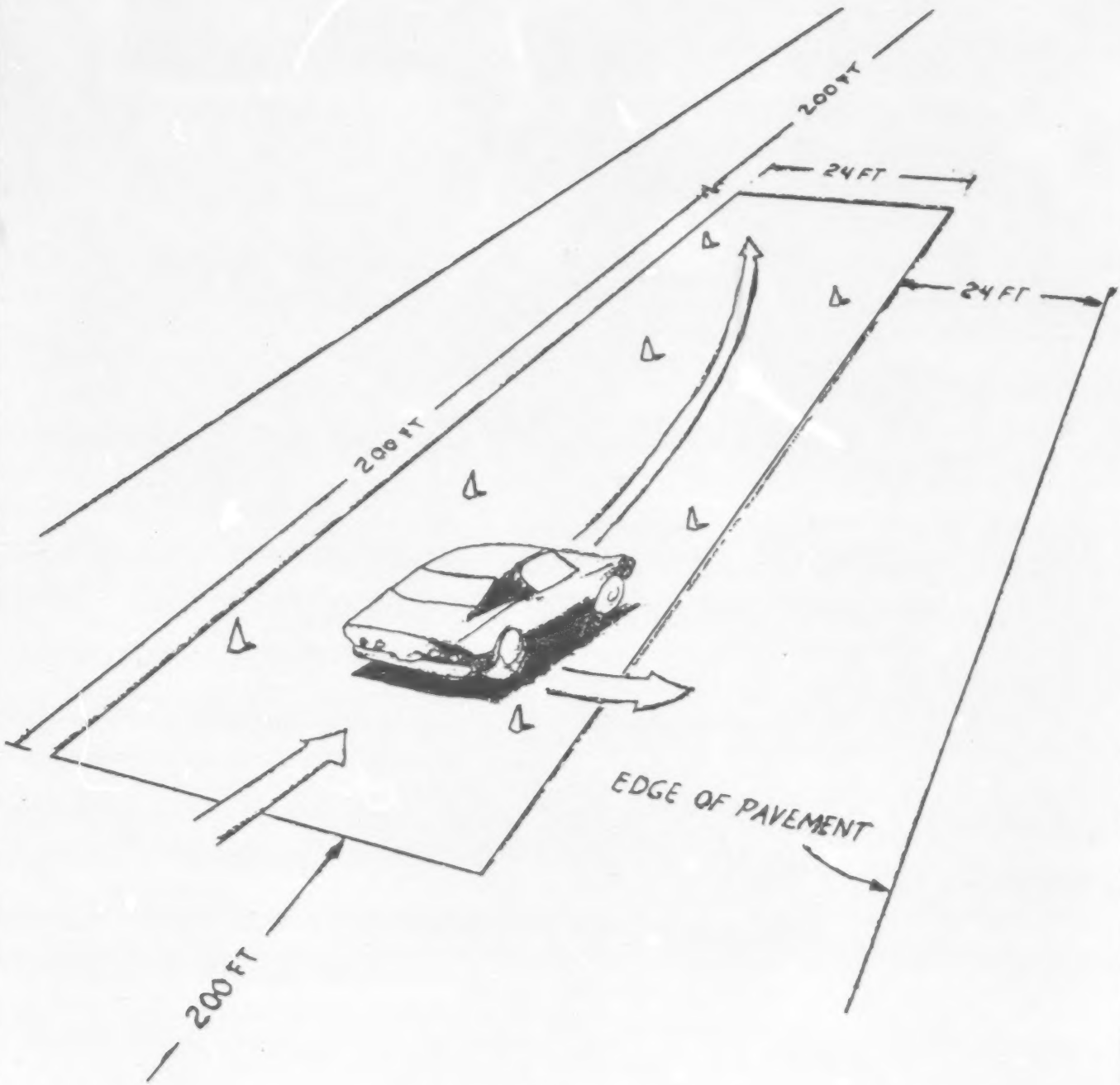
Slow recovery in getting back in proper lane - hits second barricade

Does not add enough steering input - hits the barricade

Locks brakes - loses steering control.

Anticipates the cue and brakes too soon-deaccelerates

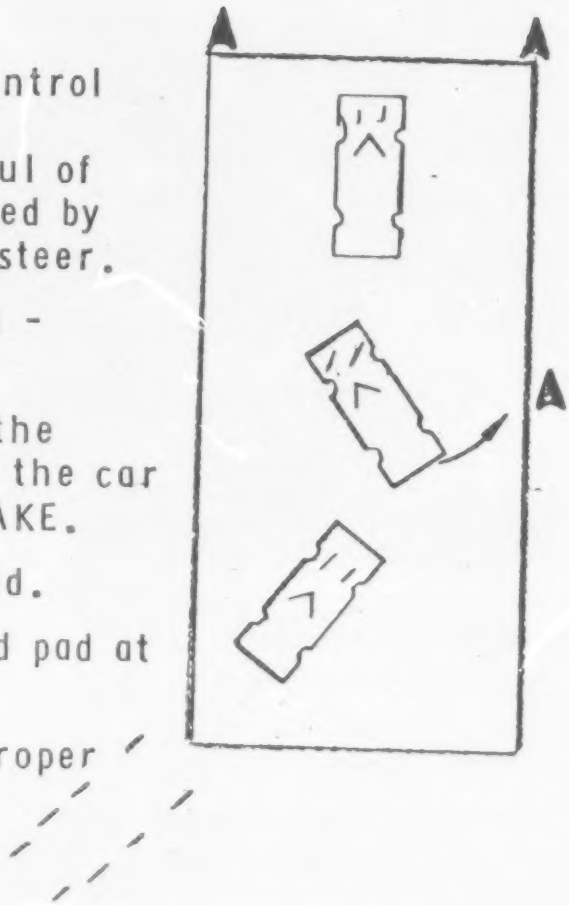
SKID CONTROL MANEUVER



Unit 8

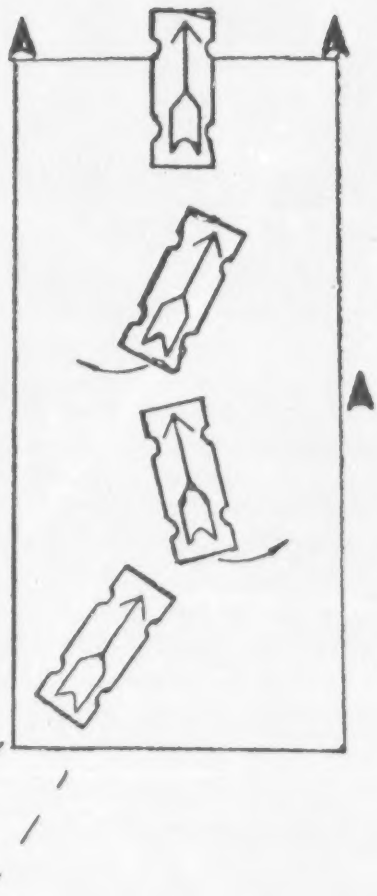
Procedure For Skid Control

6. Caution - be careful of second skid - caused by too much counter steer.
5. When car responds - counter steer.
4. Student steers in the direction you want the car to go. DO NCT BRAKE.
3. The skid is initiated.
2. Student enters skid pad at an angle.
1. Student assumes proper driving position.



Unit 8

Problem Areas for Skid Control



-Hits brakes and locks wheels

-Relaxing after first skid, and not ready for second skid

-Over responds causing second skid

-Panics and takes no action

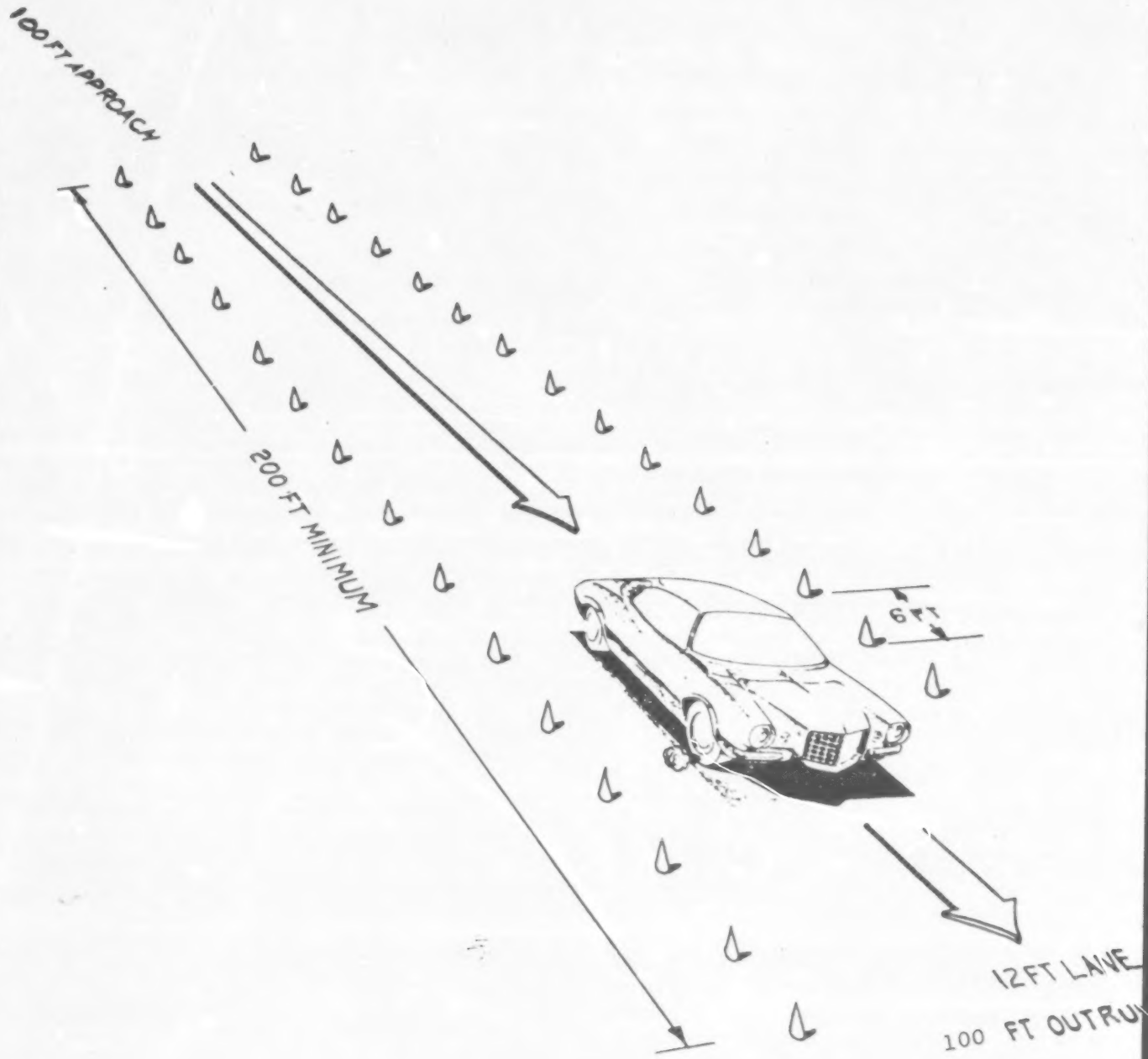
-Turns steering wheel in wrong direction

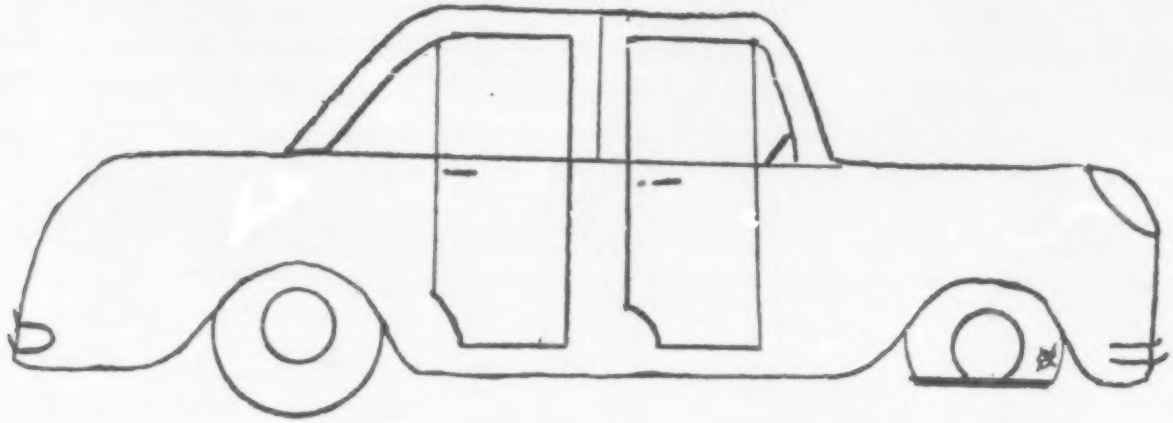
-Slow response to first skid, vehicle goes beyond point of control

-Tries to accelerate to control skid

-Does not ease up on accelerator

STRAIGHT LINE BLOWOUT



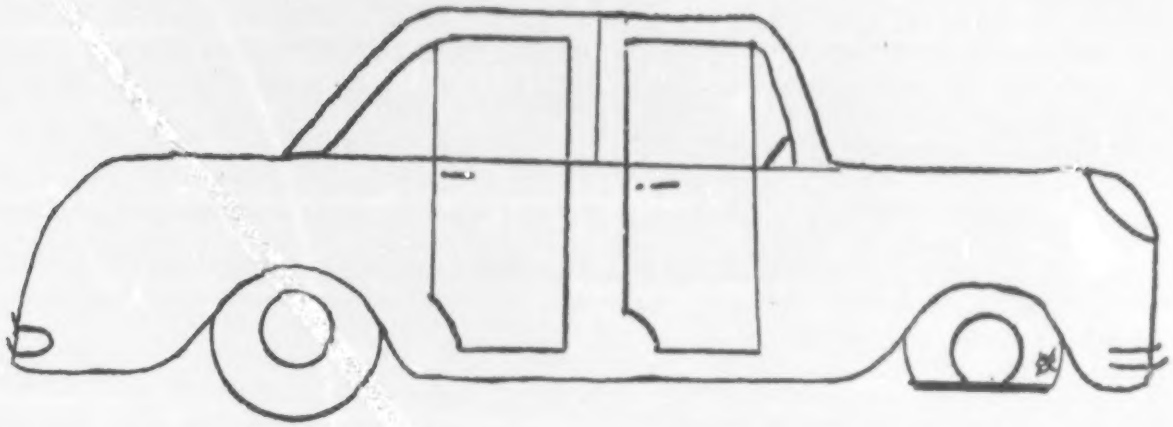


Unit 9

Procedure for Blowout

(Right Front)

1. Student proceeds down marked area at speed selected by instructor.
2. Instructor will blow right front tire.
3. Student takes foot off accelerator, without braking, and steers to the left to maintain lane position.
4. After gaining control of vehicle brake gradually to stop.



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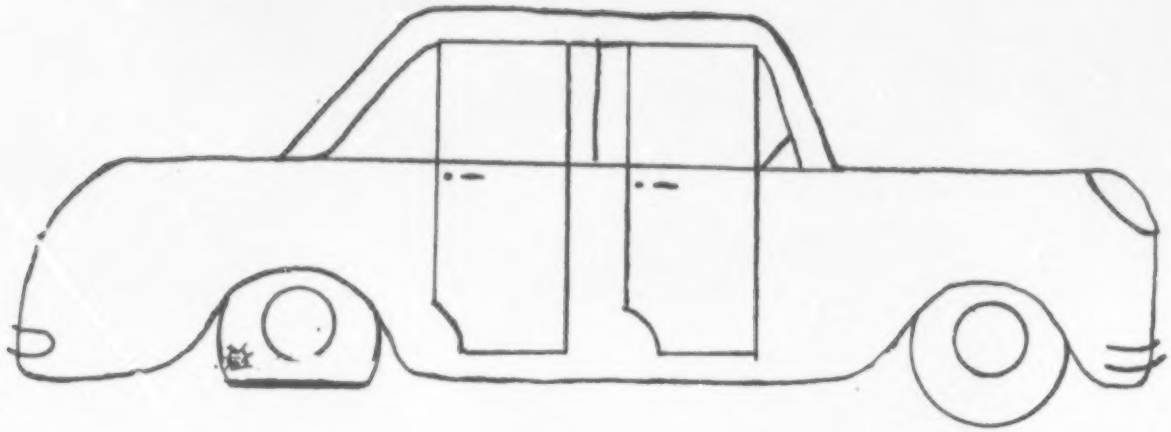
Unit 9

Problem Areas

1. No reaction.
2. Panics and brakes hard.
3. Cannot determine which tire has blown, thus steers in wrong direction.
4. Over steers causing vehicle to leave the lane.



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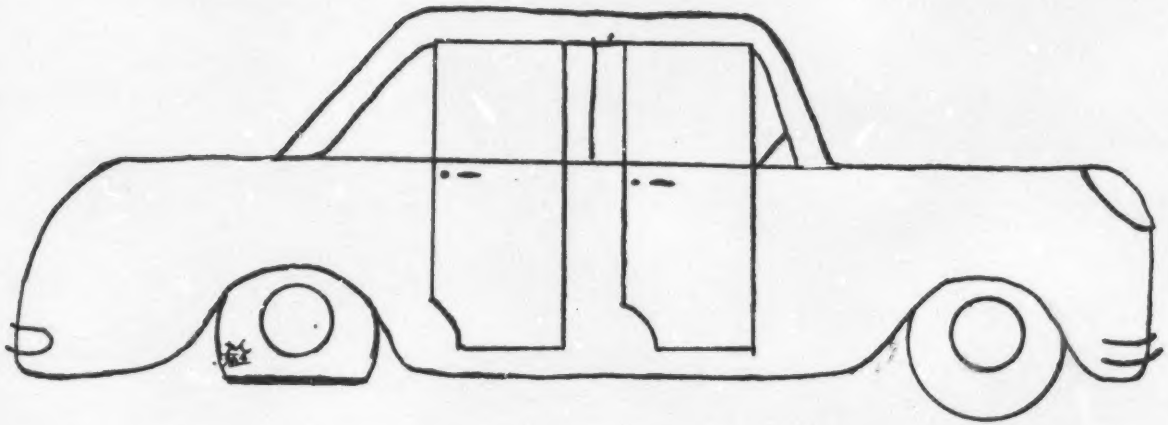
Unit 9

Procedure for Blowout
(Right Rear)

1. Student will proceed down marked area at speed selected by instructor.
2. Instructor will blow rear right tire.
3. Student takes foot off accelerator, without braking, and holds steering wheel straight.
4. After gaining control of vehicle, brake and stop.

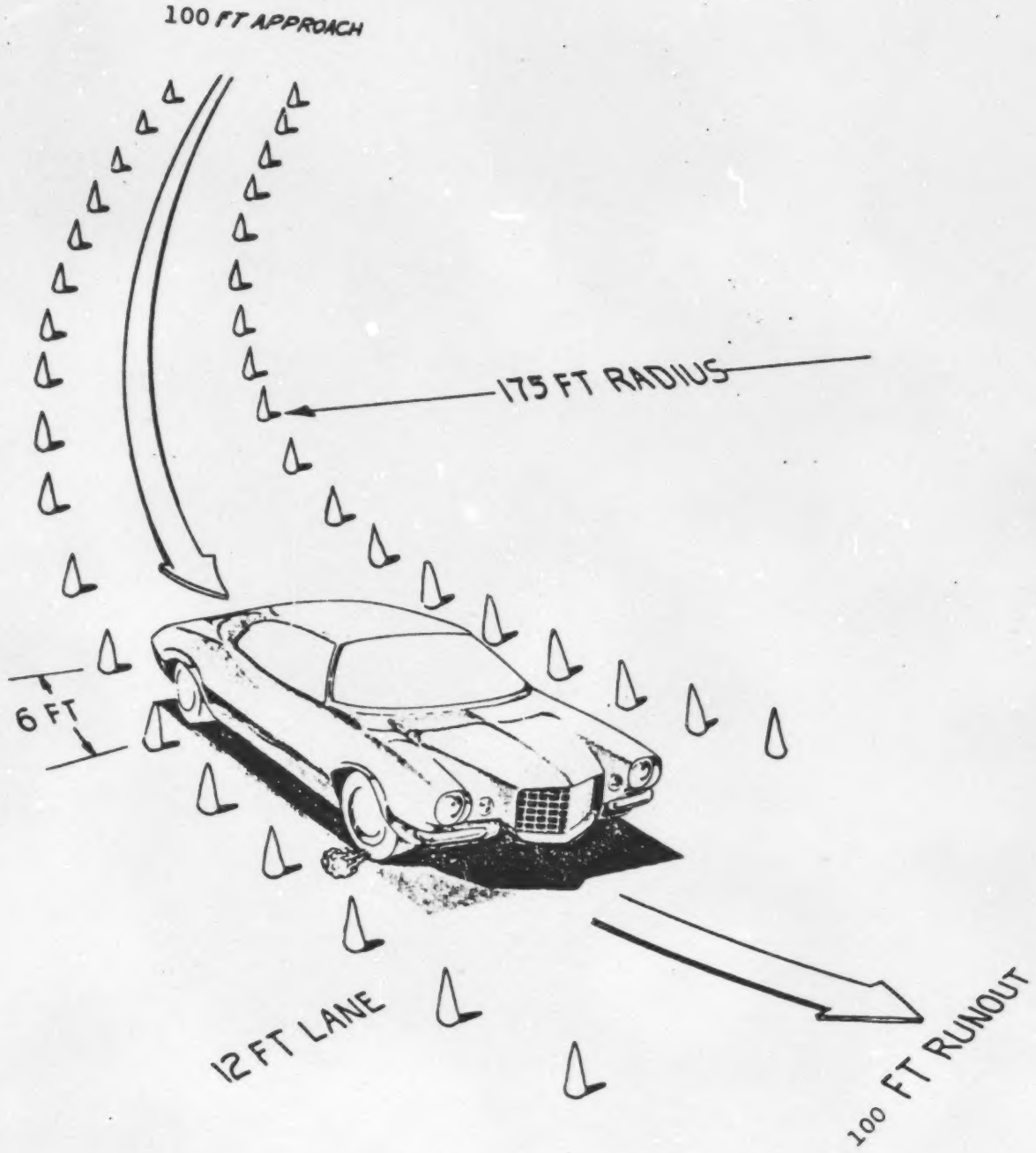


Unit 9

Problem Areas

1. Steers right or left causing car to sway from side to side.
2. Panic brakes, loses steering.
3. Cannot tell if tire is blown or which tire has blown thus steers in wrong direction causing swaying.

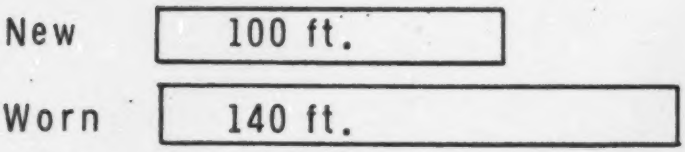
BLOWOUT IN A CURVE



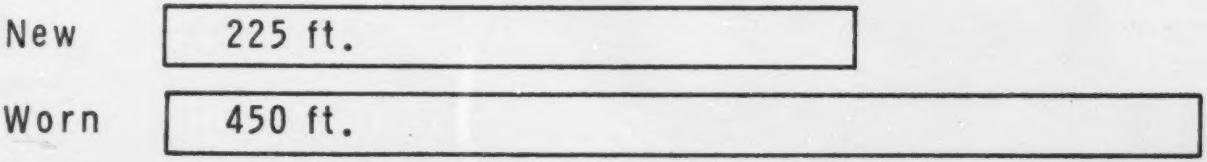
Vehicle Stopping

Wet Good Pavement

(Stopping Distance 45 mph)



Wet Slippery Pavement



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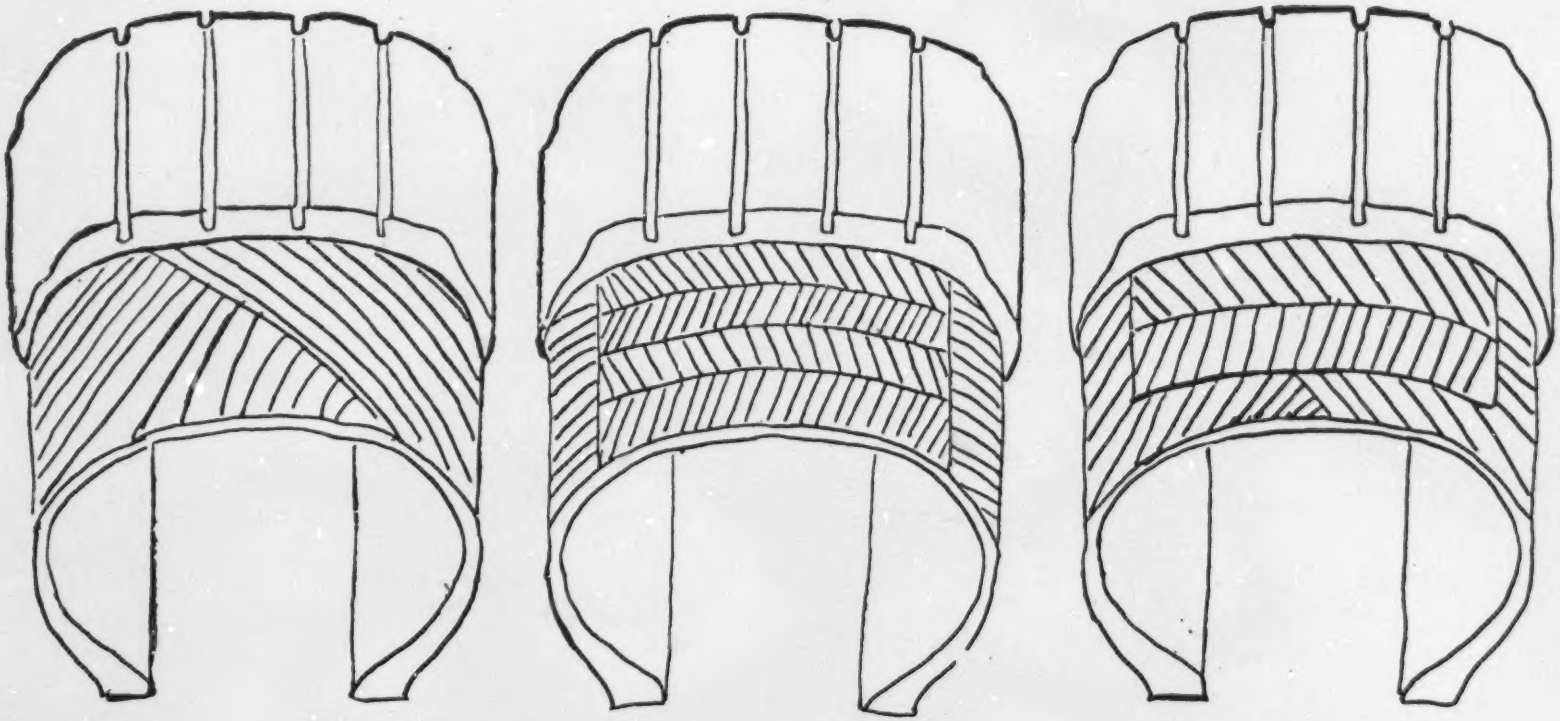
New tires improve in traction for a short period of time.

50 o/o of tire tread gone - traction decreases significantly.



1. Bias

2. Radial

3. Belted Bias

MANUFACTURER'S NAME
NAME OF TIRE
4 PLIES UNDER TREAD (2 XXXX CORD) + (2 XXXX CORD)
SIDEWALL 2 PLIES XXXX CORD
DOT XXXX XXXXXX
MAX. LOAD 1500 LBS @ 32 PSI MAX. PRESS.
LOAD RANGE B (4 PLY RATING)
F78-14 (REPLACES 7.75-14)

THE SIDEWALL STORY

1. Name of Tire
2. Manufacturer's Name
3. F 78-14

   F - Identify size of the tire (lower the letter, smaller the tire size)

   78 - Tire is 78 o/o as high as it is wide

   14 - Indicates rim size

   If H R 78-15

   ↓

   Radial

4. Load Range (letter B, C, D) to identify tires with their particular load and inflation limits and service requirements.

   Load Range B 4-ply rating
   Load Range C 6-ply rating
   Load Range D 8-ply rating

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5. "Maximum load 1500 lbs. @ 32 psi Maximum Pressure" - indicates tire's load limits and maximum cold inflation.

   For normal operation follow Owner's Manual.

6. DOT xxx xxxxx - Tire identification number, the first identifies tire manufacturer, remaining character identify size, type, and date of manufacture.

7. "4 plies under tread (2xxx cord + 2xxx cord) Sidewall 2 plies xxx cord." - indicates tire ply composition which depend upon materials used.

8. "Tubeless" Tire must be marked either "tubeless" or "tube-type." If radial, word "Radial" must also be carried.

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INFLATION

"Proper Inflation is the most important rule in tire safety and tire mileage."

Tips:

1. Check tire inflation every few weeks.
2. Check pressure when tires are cool (driven less than 1 mile at moderate speed).
3. To insure accurate tire inflation use only a "Pencil Type" gauge.
4. Never "bleed" or reduce air pressure when tires are hot.

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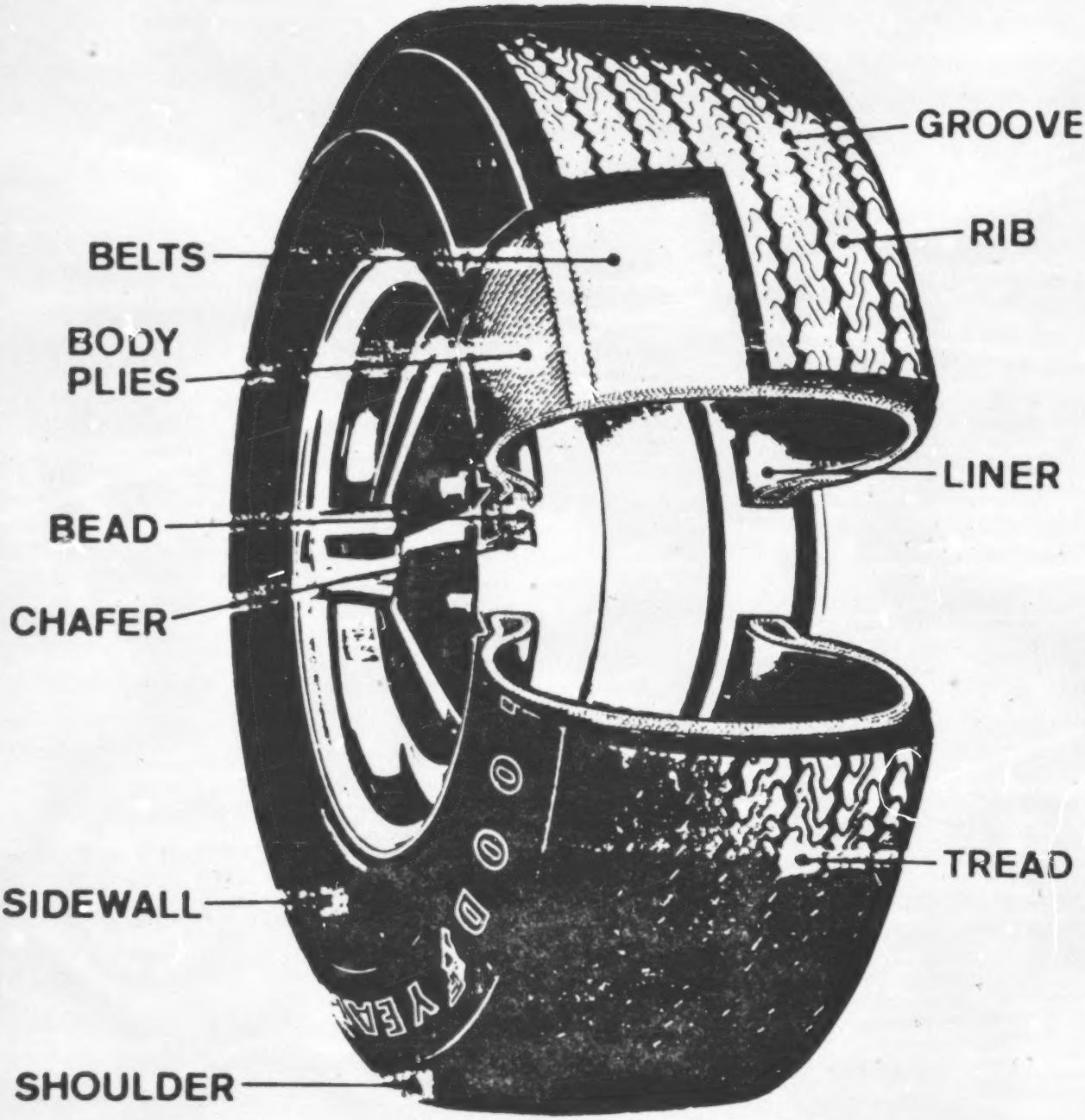
INFLATION

Underinflation Proper Inflation Overinflation


GROOVE
RIB
BELTS
BODY PLIES
LINER
BEAD
CHAFER
TREAD
SIDEWALL
SHOULDER

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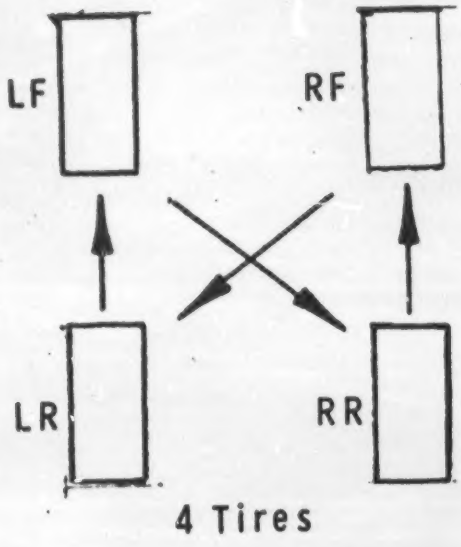
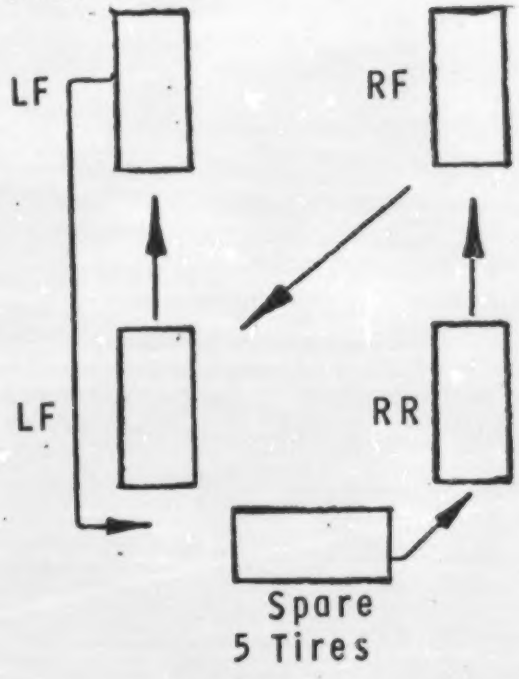
ROTATION

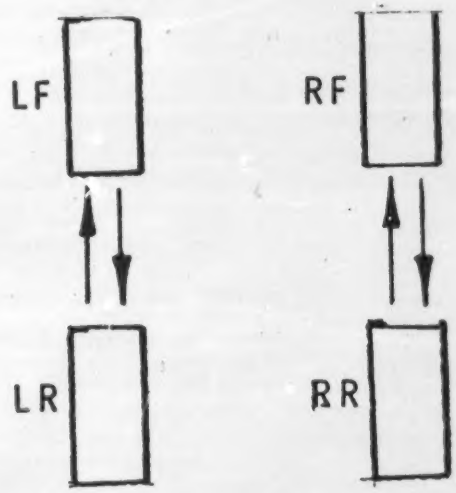
Bias and Belted Bias Tires



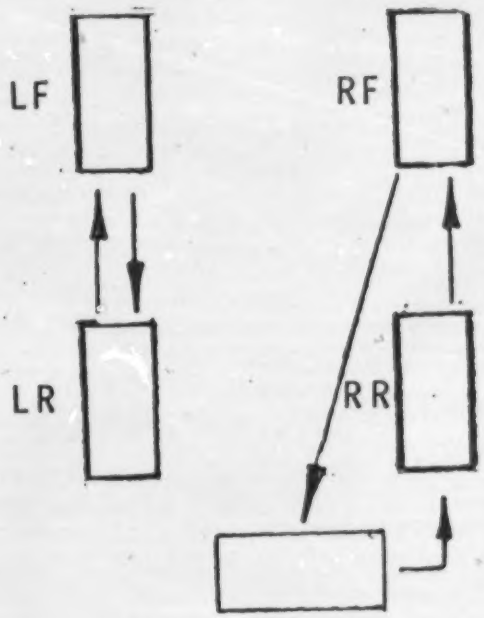
4 Tires



Spare
5 Tires



4 Tires



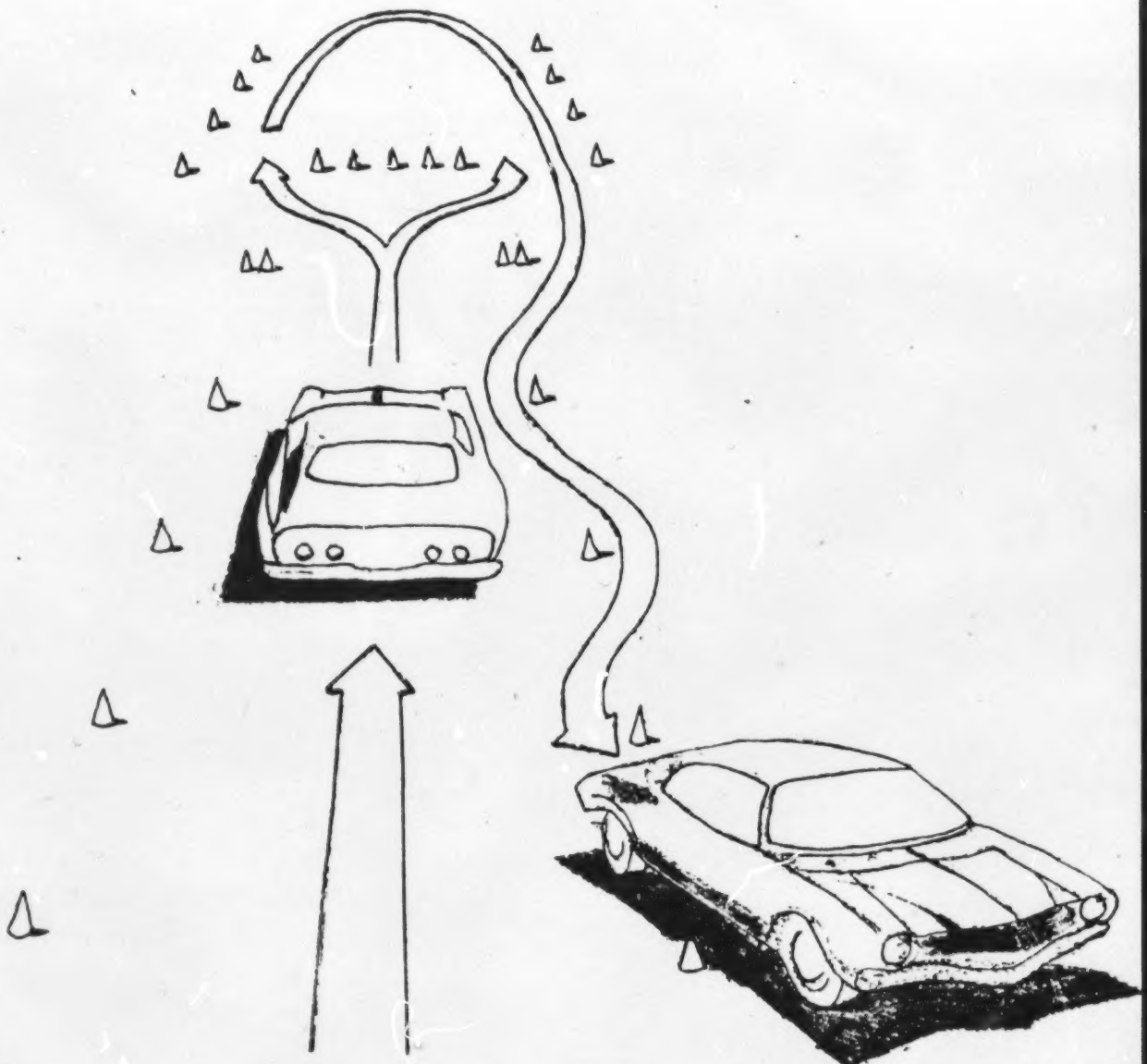
Spare
5 Tires

RADIALS

How To Select Replacement Tires

1. Never choose a smaller size than those which came with the car.
2. Interchangeability of different types and profiles of tires is not always possible due to differences in load ratings, tire dimensions, fender clearances and rim sizes, particularly with older cars.
3. Best all-around car handling tires of the same type or construction should be used on all four wheel positions.
4. "Break-in" period is recommended for new or previously unused tires - limit speed to 50 mph for the first 50 miles.

EVASIVE MANEUVER AND SERPENTINE COURSE
IN CONJUNCTION



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GLOSSARY

1. Acceleration: Rate of increase in speed of a vehicle.

2. Approach Lane: Designated lane of travel (12') leading to a maneuver.

3. Defensive Driving: By the use of SIPDE procedures the driver seperates and compromises potential hazards within the driving environment.

4. Double Cue Cone: The point at which the instructor indicates a command (or cue) to the student to initiate steering and/or braking. It is identified by placing two cones at the same spot.

5. Evasive and Emergency Maneuvers: A series of training exercises which have been developed to improve the driver's skill for certain driving tasks. It also gives the driver a better understanding of the capabilities of the vehicle.

6. Exhaust System: Includes exhaust manifold, exhaust pipes, mufflers, and tail pipes.

7. Four Second Interval: Safe stopping distance behind another vehicle.

8. Hand Over Hand Steering: A method of steering when turning, in which one hand always grips the wheel firmly, so that jerky movements with both hands are eliminated.

9. Inflation Pressure: Is measured in terms of psi (pounds per square inch of air pressure.) Should not fall below the suggested minimum or be above the suggested maximum as recommended by the car manufacturer.

10. Mastery: Degree of expertise demonstrated by the student which meets the criteria set up for a specific maneuver.

11. "Nine and Three" Hand Position: A balanced hand position that enables one to make a 180° turn of the steering wheel in the shortest possible time.

12. Oversteering: Putting to much input into the steering wheel causing the vehicle to alter from its intended path.

13. Panic Braking: Overapplication of the brakes which exceeds the traction limits of the tires.

14. Range Facility: Off-street controlled area used to practice driving maneuvers.

15. Second Skid: Caused by over-correcting for the first skid and thereby inducing a skid in the other direction.

16. Skid: A loss of traction where the tires are not geared to the road surface.

17. "Squeeze" Braking: Ability to increase constant pressure on the brake pedal to get maximum stopping efficiency without locking the brakes.

18. Steering Input: The amount of steering needed for a vehicle to maintain its intended path of travel.

19. Suspension System: Made up of springs and shock absorbers which connect the car's frame to its wheels. Tires may also be considered a part of the suspension system.

20. Traction: Adhesive friction of the tires on a road surface.

21. Tread Depth: The minimum legal tread depth is 2/32 inch and is indicated on newer tires by a tread-wear indicator bar that is built into the tire.

22. Twelve Second Rule: Method of determining minimum sight distance; A twelve second path of travel.

23. Two Second Interval: Safe following distance behind another vehicle.

24. Vehicle Lighting System: Includes brake lights, headlights, parking lights, signal indicators, emergency flashers.

25. Wheel Alignment: The proper adjustment of the front wheels so there is no pull to the right or left or uneven tire wear.